

# COAL AGE

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Has it ever occurred to you that in these days of dawning in efficiency organization and safety first, many coal officials fail to scrutinize the warp and woof in the fabric of their mining operations? These same individuals regale themselves in wordy talks on economy, hold up their hands in holy horror at the semblance of an excessive "first cost" when purchasing, yet fail to extract efficient service from the material they buy.

Should we classify this personal quality as a human frailty? Perhaps, but let us look still farther.

"Safety first" flashes across your mental vision by instinct as the first and last care of operation. The efficiency of the workman holds, logically, the next place in your thought. On the heels of this comes the necessary balancing of cautious purchases with the careful attention to the service rendered by the material. Yes, *careful attention* is right.

Can you, Messrs. Manager and Superintendent, be candid with yourselves in answering the next two questions?

Have you steel rail, compressed-air or water pipe, electric wire or anything else in your abandoned workings which is still available for use in some other part of your mine? Have you thought of that, or are you merely putting off the utilization of this second-hand material until "tomorrow"?

Without casting reflections, grant that you have these materials in accessible but worked-out rooms. Still further, for the sake of discussion, admit that these materials (partly used) have not been reclaimed because of the oversight of an inside boss. Again, since neither you nor the engineers ever wander through these abandoned workings, you know nothing of the conditions there and hence cannot order an adjustment.

Is this consistent with the extreme caution you exercised in purchasing this rail, pipe or what not? *Decidedly not.*

To bring out more clearly the inconsistency of this pseudo-economy, which saves at the spigot and wastes at the bunghole, let us re-

view the following instance, which by the way is not an hypothesis.

A coal-mining company whose annual output is over two million tons, installed an electric power plant, to operate on the exhaust steam from noncondensing engines. The newly installed plant, which cost \$70,000, enabled the operators to abandon the former electric plant whose annual operating cost was \$15,000. This was consistent with efficient management and operation.

On the other hand, this same company has one 1000-ton mine with 3000 ft. of 3-in. compressed-air pipe, with half its use still available, lying in an old heading. In a second mine there are 30 idle-room switches and two miles of steel rail that has not outlived its usefulness. In yet another mine, electric cable and lighting wire hang on the timbers in old workings.

A rough estimate shows that the company loses between \$500 and \$1000 annually at each of ten mines. The reason is self evident.

It would cost this corporation five dollars per day to have one of its competent engineers make the rounds, and report possible economies to his general manager. Such a report, made once in 60 days, taking 10 days to cover 10 mines would cost \$300 per year. The total resultant saving would vary between five and ten thousand dollars annually—a nice return on the \$300 invested.

There are, of course, mines where the cost of labor in reclaiming material from old workings makes such a scheme impracticable; however, these instances are isolated exceptions to the general rule.

Nothing is more rare than consistency. Most of us practice economy upside down. In such matters we are generally ambidextrous, easily and heedlessly spending with our left hand what we save with our right. Sit a moment and think—

**Are you saving at the spigot and wasting at the bunghole?**

—Outlined by Newell G. Alford

# Working Thick Highly Inclined Seams

BY JOHN E. AMBROSE\*

**SYNOPSIS**—Description of the general methods employed for working thick seams of coal on steep pitches, in Colorado and British Columbia.

The following description of the general method employed in working semibituminous and lignite coals in Colorado and used, also, extensively in British Columbia, is of particular interest in connection with all deep-pitching seams.

In most cases where this method is in use, the seam of coal pitches from 50 to 85 deg., or is practically vertical. If the location is favorable, a shaft or slope is sunk on the outcrop of the seam. This shaft or slope has generally three compartments; namely, two hoistways and a pumpway, which is used also for installing the electric wires supplying light and power to the mine. The shaft is sunk in the seam until it reaches a point where the latter dips away at a greater angle from the vertical. From this point the shaft is continued downward in the rock, until a certain required distance is attained for a lift of, say from 300 to 350 ft. Here, a tunnel is driven wide enough to afford ample room for the handling of the coal, at the landing.

This tunnel is driven over to strike the seam of coal and will vary in length, according to the depth of the shaft and the pitch of the seam. Gangways are then turned to the right and left, on the strike of the seam,

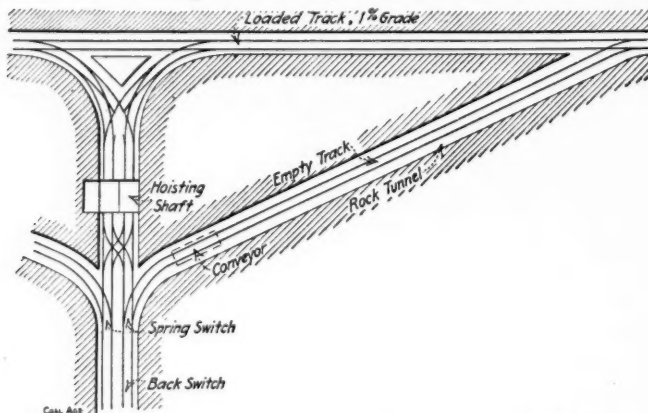


FIG. 1. PROPOSED PLAN FOR LOADED AND EMPTY TRACKS AT LANDINGS UNDERGROUND

and should be of sufficient size to handle a good car with ease and safety. These gangways are pushed ahead to insure a quick development of the mine. They should be given a grade of one-half of 1 per cent., or about 6 in. per hundred feet, in favor of the loaded cars.

Another force of men can be put to work, at the mouth of the tunnel, where it strikes the seam, to widen out the gangway, to accommodate two tracks. These sidings built at the mouth of each gangway should be long enough to hold about 100 loaded cars, on each side of the tunnel. Long collars should be used of sufficient size and strength to withstand the top pressure, so that there will be no necessity for center posts, as these are always a source of danger both to drivers and others who are handling the coal, on the sidings or making up trips. Unless the conditions prevent it, steel I-beams should be

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used instead of timber, for the collars. These should be supported on concrete walls. This arrangement would give more room, look 50 per cent. better, cause less risk from fire, and possess greater strength and durability.

As shown in Fig. 1, the empty cars are run off the cage to the back switch and then to a point on the cutoff marked "conveyor." This conveyor, which is kept constantly running, picks up the empty cars and carries them through the cutoff, or tunnel, shown driven through the rock on each side of the shaft. Where this cutoff meets the gangway, the cars are picked up by the motors and hauled to the face of the workings.

At the end of each siding, a sufficient barrier pillar should be left to protect the shaft in emergency. This pillar should vary in width according to the depth from

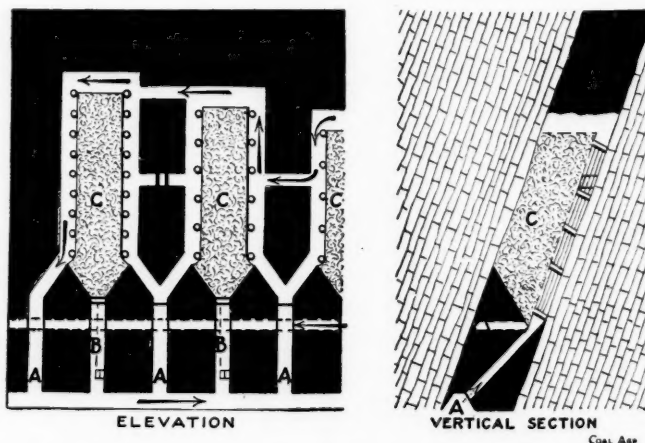


FIG. 2. VERTICAL ELEVATION AND CROSS-SECTION OF CHAMBERS AND CHUTES

the surface and the thickness of the seam of coal. Beyond this pillar the rooms should be turned on 80-ft. centers. Chutes *BB* are first driven up the pitch from the gangway to the air course above, a distance of about 50 ft., as illustrated in Fig. 2. The chutes are continued above the air course, a distance of about 20 ft., at which point the rooms *CC* are widened out on a 45-deg. angle, as shown in the figure, to a width of from 40 to 50 ft., depending on the condition of the roof and floor of the seam. In many cases a separate manway *AA* is driven the same distance, up the center of each pillar and branched to meet the manways in the rooms.

The rooms are driven up the pitch of the seam, and a manway constructed on each side of the room. Cross-cuts are driven in the pillars, at regular intervals, as shown in the figure, to conduct the air current from room to room, and cause it to sweep the working face better. The length of the rooms will depend upon the distance to the gangway above; but a chain pillar or barrier should be left, of sufficient strength to protect the upper gangway. This chain pillar will vary from 100 to 150 ft. in thickness.

It is common practice to drive the rooms up on a yardage basis, since the coal is stored in the chute in each room and is only drawn as required. The pillar separating the gangway and the air course above is about 50 ft. in width. The size of the air course is slightly less



than that of the gangway, being 7 ft. collar, 10 ft. spread and 7 ft. clear headroom. The timber sets on both the gangway and the air course, are spaced 6 ft. centers and wedged or spragged at the top to prevent swinging. Good stout round lagging is used above the timbers.

It is common, in deep-pitching seams, to drive the gangway and air course, as shown in the vertical section on the right, in Fig. 2, next to the top slate. This enables the loading chutes to be driven across the seam at a suitable angle for loading. By reducing the angle of the chute, in this manner, the coal is more easily controlled as it slides down the chutes to the cars. The manways on each side of the chute are from 7 to 8 ft. wide and furnish the means of ingress and egress to the working face. The system of ventilation generally adopted makes the hoisting shaft a downcast. Where the tunnel meets the gangway, the air current is divided, part going to the right and part to the left. The air follows the gangway to the face and returns through the rooms. In case of accident or fall of roof in one or more rooms, the air is conducted across the trouble, by means of the short "monkey airway" or crosscut connecting the room with the airway above the gangway.

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## Cost of Small Frame Buildings

The bills of material and costs of three frame buildings erected for a construction camp are of interest to the mining industry, since the buildings are of the type and description frequently found installed in small camps and remote properties. The buildings are described by Clark A. Bryan (*Eng. & Cont.*, July 2, 1913) as follows:

One building was used as a store and dining-room combined. It was 36x16 ft. in plan, built with a gabled roof 7 ft. 3 in. from the top of the floor to the top of the plates, with a total height of 11 ft. 9 in. There were two rooms, 11 ft. 6 in. and 24 ft. 6 in., respectively, the former used as the store. The sills were made of 4x6-in. lumber, the four corner posts and the intermediate posts, of which there were two on each of the long sides, of 3x4-in. material. These upright posts were all mortised into the plate, which was of 4x4-in. material. As an additional brace a piece of 2x4-in. was run completely around the building between the uprights, 3 ft. above the floor. The building was braced in the direction of its short dimension by running a piece of 2x4-in. material from the top of one of the intermediate posts to the top of the opposite post, these braces set flush with the top of the plate. The 2x4-in. rafters were nailed to the plate. There were 19 rafters on each side, 10 ft. long, overhanging the sides by about 8 in. A piece of 1x5-in. material was nailed over their ends as a sort of trim.

The 1x3-in. purlins were laid at right angles to the rafters and nailed to them; they were spaced 1 ft. 6 in. on centers. Corrugated-iron roofing, weighing 115 lb. per square, was nailed directly to the purlins. This provided plenty of ventilation, inasmuch as at the sides the building was not tightly sheathed. The 2x8-in. joists were 16 ft. long, notched 3 in. on the sills; they were spaced 1 ft. 6 in. A 1-in. floor was laid. The sides were of 1-in. rabbeted barn boards, 10 in. wide. The partition was of this same material. There were five windows, each 2 ft. 6 in. x 2 ft., with six lights. There were three doors, each 2 ft. 9 in. x 7 ft. Table I gives the bill of materials and cost of construction.

The building used for a bunk house was 14x50 ft. in plan, built with a shed roof. It was 9 ft. 6 in. high on the high side and 6 ft. 6 in. on the low side, divided into five compartments, each of which was designed to accommodate eight men. The sills were of 4x6-in. material; the corner post and the eight intermediate posts on the long side, of 3x4-in. material. The 2x4-in. plate was spiked to the top of the posts; the 3x4-in. by 16 ft. rafters were spaced 2 ft. and overhung the plate about 8 in., being spiked to the latter. The roofing and purlins were the same as in the other house. The bracing also was similar to that of the first house. The partitions were of barn boards, 6 ft. high. Each room had one door and two windows; against each side were two tiers of bunks 3 ft. wide and 7 ft. long, the lower being 1 ft. above the

floor, and the upper resting on the 2x4-in. brace which extended around the building. The bunks were supported at the center by means of a trestle built of 2x4-in. material, braced on the sides. Table II shows the material consumed

TABLE I. COST OF DINING ROOM AND STORE

Items and Size	Rate	Cost
114 lin.ft. sills, 4x6 in.	\$0.05	\$5.70
100 lin.ft. posts, 3x4 in.	0.0275	2.75
16 lin.ft. frames for doors, etc., 3x4 in.	0.0275	0.56
104 lin.ft. plates, 4x4 in.	0.03	3.12
104 lin.ft. braces, 2x4 in.	0.015	1.56
32 lin.ft. braces at plate, 2x4 in.	0.015	0.48
380 lin.ft. rafters, 2x4 in.	0.015	5.70
432 lin.ft. purlins, 1x3 in.	0.005	2.16
144 lin.ft. ridge, 1x3 in.	0.005	0.72
36 lin.ft. ridge pole, 3x4 in.	0.0275	1.00
416 lin.ft. joists (26 pieces 16-ft.) 2x8 in.	0.028	11.70
576 sq.ft. flooring, 1-in.	0.025	14.40
752 sq.ft. barn boards in sides, 1x10 in.	0.025	19.55
72 sq.ft. barn boards in gables, 1x10 in.	0.03	2.16
150 sq.ft. barn boards in partition, 1x10 in.	0.025	3.75
40 lin.ft. tin ridge	0.06	2.40
5 windows (six 8x10-in. lights), 2 ft. 6 in. by 2 ft.	1.25	6.25
3 doors, 2 ft. 9 in. by 7 ft.	0.90	2.70
2 mess tables, 16 ft. by 3 ft.	2.50	5.00
4 benches, 18 ft.	0.40	1.60
720 sq.ft. corrugated iron roof	0.046	33.12
90 lb. wire nails	0.035	3.15
7 lb. galvanized nails	0.06	0.42
3 pairs hinges (10-in. strap)	0.25	0.75
3 hooks and staples	0.05	0.15
2 hasps and staples	0.10	0.20
1 padlock	0.28	0.28
112 lin.ft. trim, 1x5 in.	0.035	3.92
Total cost of materials		\$135.28
Labor—		
14 hr. foreman carpenter	\$0.275	\$3.85
66 hr. carpenter	0.22	14.52
41.5 hr. carpenter's helper	0.17	7.06
Total cost of labor		\$25.45
Total cost of building		160.73

TABLE II. COST OF BUNK HOUSE

Items and Size	Rate	Cost
128 lin.ft. sills, 4x6 in.	\$0.05	\$6.40
93 lin.ft. posts, 3x4 in.	0.0275	2.56
65 lin.ft. frames for doors, etc., 3x4 in.	0.0275	1.78
132 lin.ft. plates, 2x4 in.	0.015	1.98
128 lin.ft. braces, 2x4 in.	0.015	1.92
224 lin.ft. braces at plate, 2x4 in.	0.015	3.36
416 lin.ft. rafters, 3x4 in.	0.0275	11.44
650 lin.ft. purlins, 1x3 in.	0.005	3.25
405 lin.ft. joists (27 pieces 16-ft.), 2x8 in.	0.028	11.34
75 lin.ft. braces foot of posts, 3x4 in.	0.0275	2.07
800 sq.ft. flooring, 1-in.	0.025	20.00
1000 sq.ft. barn boards in sides, 1x10 in.	0.025	25.00
336 sq.ft. barn boards in partitions, 1x10 in.	0.025	8.40
500 sq.ft. barn boards in bunks proper, 1x10 in.	0.025	12.50
60 lin.ft. 2x4-in. supports for bunks	0.015	0.90
50 lin.ft. braces, 2x4 in., for bunks	0.015	0.75
132 lin.ft. trim, 1x5 in.	0.035	4.62
10 windows (six 8x10-in. lights), 2 ft. 6 in. by 2 ft.	1.25	12.50
5 doors (2 ft. 9 in. by 6 ft.)	0.54	2.70
800 sq.ft. corrugated iron roof	0.046	36.80
128 lb. wire nails	0.035	4.48
7 lb. galvanized nails	0.06	0.42
6 pairs hinges (8-in. strap)	0.18	1.08
6 pairs hooks and staples	0.05	0.30
6 pairs hasps and staples	0.10	0.60
Total cost of materials		\$177.28
Labor—		
24 hours foreman carpenter	\$0.275	\$6.60
95 hours carpenter	0.22	20.90
34 hours carpenter helper	0.17	5.95
Total cost of labor		\$33.45
Total cost of building		\$210.73

TABLE III. COST OF COOK SHED

Items and Size	Rate	Cost
40 lin.ft. corner posts, 4x6 in.	\$0.05	\$2.00
Other lumber		1.00
144 sq.ft. corrugated iron roofing	0.046	6.63
Total cost of materials		\$9.63
Labor—		
7 hr. carpenter	0.22	\$1.54
Total cost of shed		\$11.17

and the cost of the building. The cooking shed consisted of four upright posts about 7 ft. high, supporting a corrugated-iron roof 12 ft. square. In Table III are given the material and cost of the shed.

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## No Pennsylvania Report before 1914

The Annual Report of the Pennsylvania Department of Mines for 1912 will not be printed before some time in 1914. The reason for this is that they have a new state printer in Harrisburg and he is snowed under at present getting out this year's laws.

# Submarine Coal Mining

By JOHN E. SPICER\*

**SYNOPSIS**—The necessary thickness of cover an important factor. The nature and thickness of the strata overlying the seam are determined by soundings and test holes put up in the roof of the mine. Faults and wash-outs a menace. Submarine mining in Nova Scotia, British Columbia and Great Britain.

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The interest in the submarine mining of coal has greatly increased within the last few years. There is little doubt but that large areas of coal now lying under the sea will be worked in the near future. If these attempts are successful, the life of the coal industry will be greatly extended.

The opinions of mining men vary considerably on the question of the minimum cover that may be allowed with safety. This question assumes a very grave importance where it is desired to rob the pillars, or where the long-wall method of working is adopted. A considerable loss of life and property has resulted, in the past, by the error of allowing an insufficient cover for the support of the ocean bed.

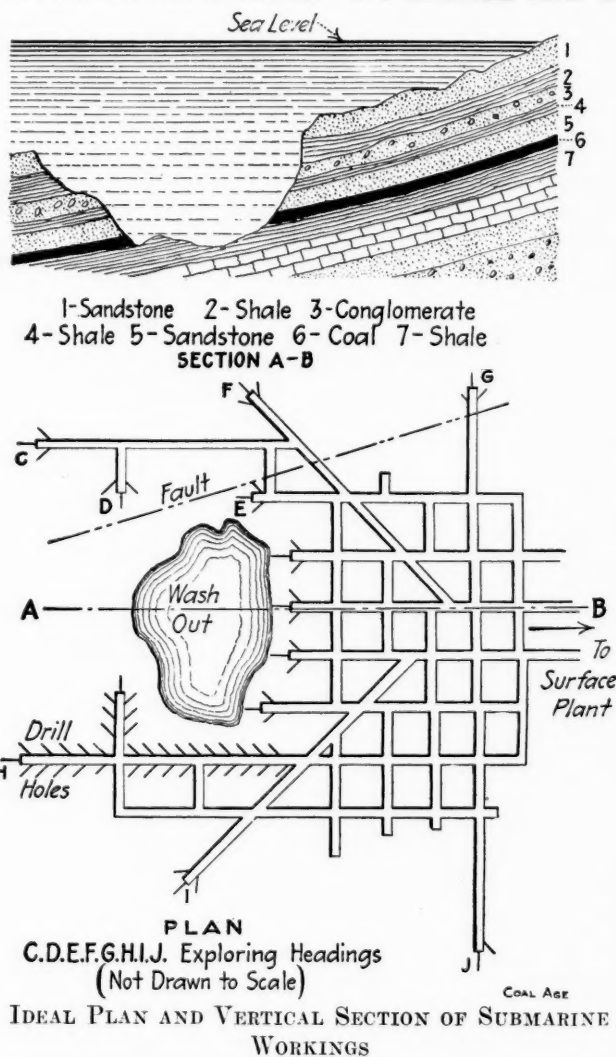
The sizes of pillars and openings that may be considered safe, in submarine mining, depend primarily on the character and thickness of the overlying strata which form the bed of the sea. The nature of the strata is of the greatest importance. The presence of beds of clay intervening between the water and the mine workings permits the work to be done with greater confidence under less cover than would be permissible in the case of alluvial or sandy deposits. A thick deposit of alluvium, forming the bed of the sea, often makes it difficult to ascertain the true thickness of solid cover overlying the coal. Beds of shale are better than sandrock but by no means as good as those of clay. The experience, in many collieries in Durham, England, where the coal has been worked under beds of magnesium limestone and other Permian strata, proves that the danger of working under these beds is practically as great as that arising from an insufficient cover, owing to the numerous washouts and solvent action of the water on these rocks.

It is customary, in submarine workings, to ascertain the thickness and character of the rocks overlying the seam, by means of soundings taken in the sea above, and by putting up drill holes in the roof strata below. The precaution is always taken, in submarine mining, of keeping a prospect or exploring heading well in advance of the other work. This heading is driven as narrow work, and a drill hole not less than 15 ft. in depth is kept in advance of the face of the heading. The purpose of this heading is not only to prospect the seam but to determine beforehand the possible presence of any faults in the strata, which are always a present danger in submarine mining. The heading also guards against the possible outcrop of the seam at the sea bed. The thickness of cover is carefully watched, in this heading, by test holes in the roof. The heading also affords protection against large washouts, or the filled-in beds of ancient lakes, rivers, etc.

The presence of faults is a continual menace to safety, in submarine mining; because the fault line affords a nat-

ural channel along which the water finds its way into the workings below. This is a common source of trouble in ordinary mining, but the danger is greatly increased when mining under the sea. The most common method to guard against danger from this source is to leave a barrier pillar of sufficient size on each side of the fault.

In Nova Scotia, there are important submarine workings, and this class of mining was made a subject of special legislation. The restrictions laid down were considered, a few years ago, too severe for accomplishing the most economical results. The minimum cover now



allowed by law over all submarine workings is 180 ft., except for prospect headings, which cannot be driven under a cover less than 100 ft. The law provides that where the cover is less than 500 ft., these workings must be laid out in panels not greater than one-half mile on each side, the panels to be separated by a barrier of at least 90 ft. of solid coal, pierced by not more than three openings not exceeding 6x6 ft., each.

Practically, the same restrictions are in force in British Columbia, where a minimum of 180 ft. of solid cover is required above the seam in all submarine workings, except for prospect headings driven in the solid coal, where the cover must not be less than 100 ft. unless expressly permitted by the chief mine inspector. The proposed

\*Cumberland, B. C., Canada.



system of working must also be submitted to the chief inspector for his approval, and cannot be altered without his permission. The mine plan must show the depth of solid cover at specified distances along all main roads and around the working faces; and soundings must be taken at reasonable distances and recorded on the plan; and when required (if reasonably practicable) the depth of marine or alluvial deposits overlying the solid cover must also be determined.

The question of minimum cover allowable when drawing pillars or working longwall is not easily determinable, even where the character of the strata is known; but much valuable information may be obtained from workings that lie under water-bearing strata.

There are many interesting instances of submarine workings in Great Britain. Among these may be mentioned the Whitehaven colliery, Cumberland, where the workings of a 10-ft. seam have extended three miles under the sea. In this colliery, the pillars are 60 ft. wide and the bords or chambers, are driven 18 ft. wide. In this case, the minimum cover under which the total extraction of the pillars was allowed was 360 ft. Where the cover was less than this amount, only 50 per cent. of the coal was taken out, the remainder being left for the support of the roof.

The complete extraction of the coal by the longwall method, with well packed wastes, seems to be more reliable and afford greater protection than is possible when the pillars are drawn in bord-and-pillar work. The subsidence of the roof is more gradual in the former case than in the latter; and, as a result, heavy fractures of the overlying strata are largely avoided. In any case, the method of working adopted must be determined by the prevailing conditions; and the success of the operation will depend largely on the care, foresight and good judgment exercised by the management.

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## A Tape-Repair Outfit for Field Use

A recent issue of the *Engineering and Mining Journal* gives the following illuminating description of an old, but none the less reliable and prompt method of repairing ribbon tapes:

It seems not generally known among engineers that a steel tape can be mended quickly in the field by soldering the two ends together, and this repair is more permanent than the usual method of riveting. A riveted joint always has a lap which has a tendency to catch on every little projection over which the tape passes, and is usually soon ripped off. A much better joint can be made by soldering, especially on the narrow 300- and 500-ft. tapes, which are especially difficult to rivet. Directions for making a soldered joint are here given:

First straighten out the rough ends of the break with a pair of pliers and clean the ends of any rust or mud. A little rubbing with a piece of paper or a small stone will suffice. Then cut a sleeve of soft tin plate, the kind used for the inner seal of some coffee cans is handiest to work with, as it can be easily cut with ordinary scissors and bent into shape with the fingers. The sleeve should be about an inch long and fitted to the tape, so that when folded down snugly the edges just come together. It is then folded around one end of the broken tape. The other end is then slipped into the sleeve just far enough to make the tape the proper length. This is determined with some other part of the same tape. The sleeve is then clamped down with the pliers to an almost snug fit, leaving just a very small crack still open. The joint is now ready to be soldered. First run in some soldering compound, holding the joint with the pliers. Now hold the joint in the flame of a candle and drop a little solder on the crack in the sleeve. It will run around in the sleeve covering all the joint.

The sleeve is now squeezed down tight with the pliers and the job is done. The tape may break again but rarely at one of these repaired joints.

A repair outfit, consisting of a small piece of candle, a few inches of soft wire solder, which can be easily melted in the flame of the candle, an inch or so of stick soldering compound, such as electricians use, or a piece of resin, a piece of a tin can, a small pair of scissors and pliers to match, weighs less than a pound and can be carried in a 6-in. canvas sack, along with the regular field outfit. A broken tape can then be repaired in a few minutes right on the job.

The writer once lost two days' time going to town to get a jeweler to rivet a tape, because he didn't know this simple scheme. He had been told "solder wouldn't hold" and believed it.

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## A Coal-Buying Syndicate in the Philippines

According to the *Daily Consular and Trade Reports*, a coöperative coal-purchasing organization has been perfected in the Philippines for the purpose of reducing costs, both in buying and handling, and to assure an adequate supply of good-grade fuels being always on hand. We quote from the report, in part, as follows:

The organization includes the Government of the Philippines, the Philippine Railway Co., which operates various railways in the archipelago, the Manila Railway Co., which operates railways in the vicinity of Manila, and the Manila Electric Railway & Light Co. At present they use, respectively, 36,000 tons, 10,000 tons, 35,000 tons, and 40,000 tons, while the Compania General de Tabacos uses 16,000 tons. The association is controlled by a board of five directors, of which two are chosen by the Governor General and the other three by other members of the association.

The association has employed a coal expert, E. Randolph Hix, who is now making an investigation of the coal mines of China and Japan and who is also collecting data as to coal tests and coal consumption from the larger industrial concerns in Hongkong, Shanghai and Japanese cities. It is thought that the entire enterprise can be managed upon an expenditure of not over 15 centavos (7.5 cents gold) per ton. The concerns, already in the organization, including the government of the islands, but not the Navy Department, which is likely to be directly concerned in it, import about one-third of the total imports of coal into the archipelago. The imports of coal into the islands from all countries have increased from 295,648 metric tons in 1907 to 322,928 in 1908, 342,047 in 1909, 375,518 in 1910, 413,735 in 1911, and 436,687 in 1912—an average annual increase of about 8.5 per cent., representing steady industrial growth in the Philippines. The purchases of the Navy average about 82,000 tons additional.

It is planned to purchase coal for the association as far as possible in a single contract for the purposes of securing the lowest possible price per unit for the fuel, regulating the arrival of colliers so that no two will be in the harbor at the same time, thus saving lighterage and stevedoring costs; and especially to purchase the coal only after exhaustive tests as to ash and calorific power and on the basis of a bonus for increased fuel efficiency in the fuel bought. The value of the combustible material in most coals purchased in the Philippines from China, Japan and Australia runs about the same, allowing for a variation of about 5 per cent., ranging from 7500 to 7900 heat units per kilo (2.2 lb.); but the amount of ash and moisture carried varies so greatly as to materially affect fuel costs. In a recent purchase by a large consumer in the islands it was found that coal in one pile averaged 10 per cent. more efficiency than that in another pile bought of the same parties from the same locality and for the same price. The association expects to buy its coal on the basis of a contract price for a standard number of heat units and percentage of ash, the price to be increased for an increased proportion of heat units and a reduced proportion of ash, or decreased with decreased units of heat and increased proportion of ash. It is to ascertain the best and most economical proportion of combustible material and ash for the best price among the coals reasonably available in this field that investigations are now being made.

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The original supply of coal in the states of Iowa and Missouri is estimated to have been respectively 29,160,000,000 short tons and 40,000,000,000 short tons. Of this amount 0.4 per cent. has been mined or wasted.

## Coal Development in Nagasaki

According to U. S. consular reports, the mining industry in the Nagasaki district of Japan was extremely prosperous during the season of 1912. Coal operators, especially, had a busy year, and at times had difficulty in getting sufficient tonnage to make their foreign shipments, which go to Vladivostok, Siberia, and Bombay, India.

One of the largest coal companies here contracted for the delivery of 55,000 tons of coal to the Great India Peninsula Ry., at Bombay, and it is expected that a contract will be made to supply coal to the Central India Ry. This invasion of Indian markets by Japanese fuel in competition with the best Bengal coal has aroused much interest. The competition will probably be keen. It is reported that the Kiushu coal is as good as the best Bengal fuel, and as there is plenty of it, and freight rates are low, it is likely that it will continue to go to Indian markets. There is now a large and increasing demand for Japanese coal in Singapore, Penang, Colombo and Manila, and prices have advanced in consequence from 30 to 50 sen (15c. to 25c.) per ton.

As a consequence of the increased demand for Kiushu coal, many of the smaller mining concerns are being consolidated with the larger companies, and new machinery is being installed and the output increased. One of the largest of these companies to amalgamate with the Mitsui Bussan Kaisha, the largest coal operators in Japan, is the Matsushima Colliery, a new company being formed with a capital of \$1,000,000, of which 60 per cent. was taken by the Mitsui Bussan Kaisha, and 40 per cent. retained by the former owners, the Koga family. The present output of this mine is 300,000 tons, but this is soon to be increased to 500,000 tons.

Another mine near Nagasaki called the Sakito Colliers Co., and owned by the Kiushu Coal & Steamship Co., has an annual output of 250,000 tons, which is to be increased shortly. All the output of this mine is contracted for by the Imperial Government Railways Board. This mine gives employment to 1223 miners and 454 artisans and other laborers, while the Matsushima mine employs 1675 miners. Both of these properties have modern American machinery, which was installed in 1912.

The island of Amakusa, off the southwest coast of Kiushu, and some 20 to 25 miles distant from Nagasaki, has a fair-sized area of anthracite, which hitherto has been worked only in a primitive way. The Daito Kogyo Kaisha, a Tokyo mining company, has a plan for the development of the Shiki collieries of this field, and claims that, by the introduction of modern machinery, the daily capacity of 250 tons can be increased to 1000 tons, as the field is extensive. The coal seams run under the sea some distance, and the pits are only three miles from the port of Tomioka, Amakusa Island, with a light railway making connection between the mines and the port. It is proposed to increase the capital stock to \$500,000 in the reorganization and development scheme.

The coke plant of the Mitsui Bussan Kaisha, at its coal mines at Miike, has been very successful, and it is planned to establish similar plants at other mines to make use of the coal dust for coke and byproducts. The capacity of the Miike coke plant is 300 tons of coal dust at each charge, and the time of coking is 26 hours.

## Kentucky's Coal Production

The State of Kentucky in 1912, according to E. W. Parker, of the U. S. Geological Survey, produced 16,490,521 short tons of coal. This was an increase of 2,440,818 tons over the figures for 1911 and nearly 2,000,000 tons over the former maximum output of 1910. There was also an increase in value in 1912 of \$2,845,749 over the figures for 1911.

The number of men employed in the mines in 1912 was 24,304, and the average production per man was 678 tons. In 1912, 66 per cent. of the coal produced was machine mined. There were during the year 51 fatalities in and about the mines, 41 underground, 2 in shafts and 8 on the surface.

Kentucky is the only coal-producing state which has within its borders areas belonging to any two of the distinctly separate great coal fields. The eastern counties are underlain by the coal beds of the great Appalachian Mountain system, extending entirely across the state in a northeast-southwest direction, while the southern limits of the central or eastern interior coal fields, are found in the more northern counties of the western section.

The total area underlain by coal in the eastern counties of Kentucky is estimated at 10,270 square miles, and the coal-bearing areas in the western part of the state are estimated to contain 6400 square miles. Up to the close of 1911, the larger part of the production has been from the western district, but as a result of extensive developments in Harlan, Johnson, Letcher and Pike Counties, the larger part of the coal production in 1912 was from the eastern part of the state. The eastern Kentucky coals are mostly of the high-grade gas or coking varieties, with some cannel coal.

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## Track Work in Mines

The *Engineering and Mining Journal* recently published the following interesting notes on track work in mines:

The illustrations on next page show some details of underground track work and one of the motor turns used in the mines of the Republic Iron & Steel Co., on the Mesabi range. Figs. 1 and 2 show a right and left turn. As a rule, the location of a turn is determined before the drift is driven and the necessary sets are put in place to make the turn when required. Props are placed under the ends of the two caps resting on the opening set until that turn is to be driven. A 9-ft. by 6-in. post is used under both of these caps and on either side the posts of each set are shortened six inches until an 8-ft. post is reached, which is the length of post used in motor drifts. When the opening set is placed in position, a point is placed on the set and on the 10-ft. by 9-in. set and with this line the rest of the turn is put in with the aid of the other dimensions shown. Figs. 3, 4 and 5 show the track layout and frog details used in connection with a 25-ft. radius timber turn. The frog is designed so that it can be used for either a right or left turn. The stub switch has given better satisfaction for underground work than the point switch. The latter caused considerable trouble by dirt getting between the wing rail and track, which interfered with its closing. Figs. 6 to 10, inclusive, showing details of switch stand and tie-rod connections, are self-explanatory.



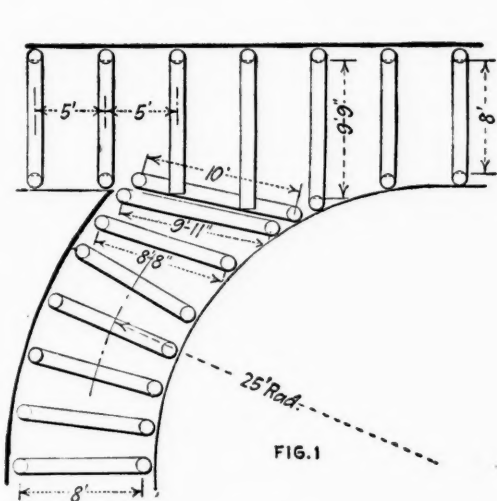


FIG. 1

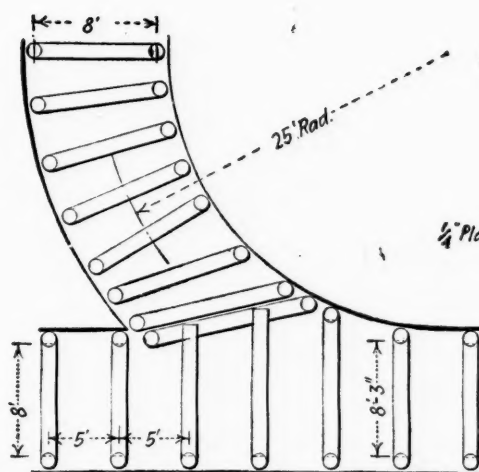


FIG. 2

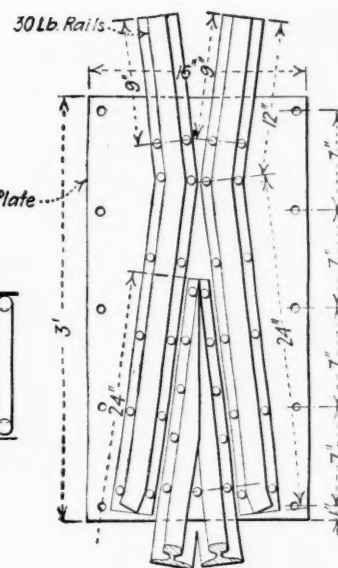


FIG. 3  
RIGHT OR LEFT FROG

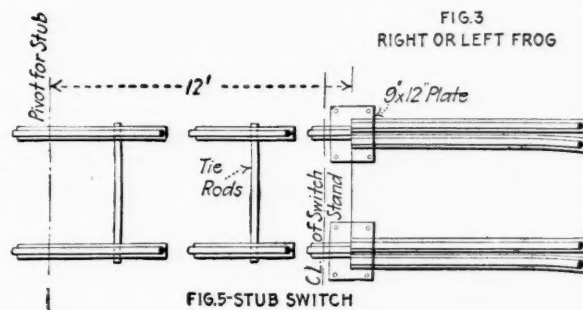


FIG. 5-STUB SWITCH

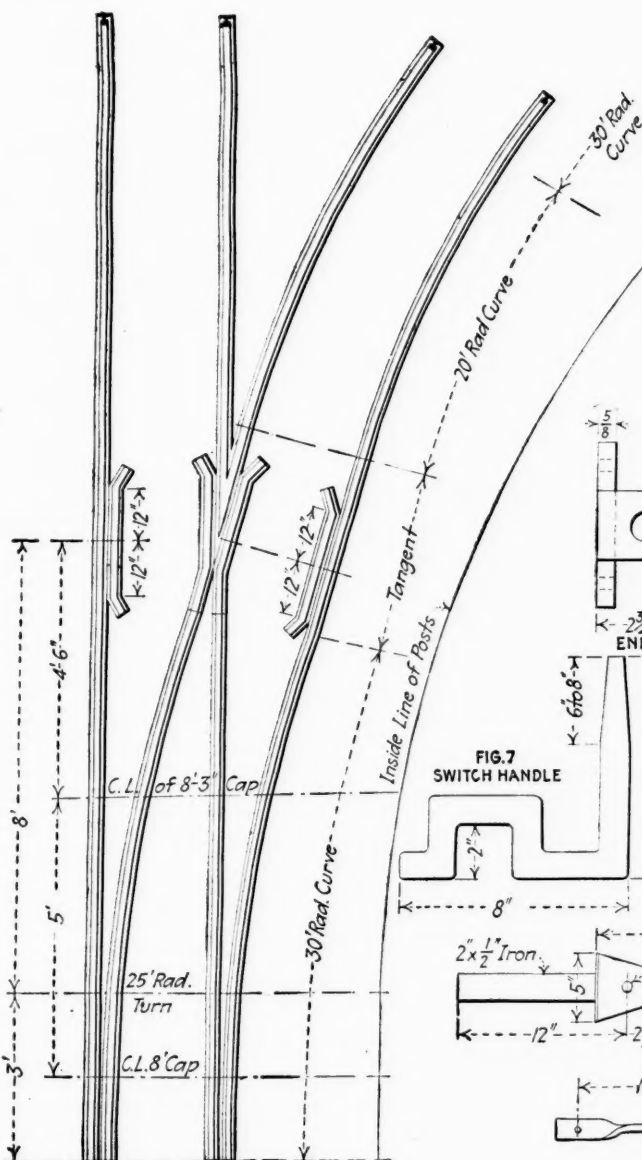


FIG. 4

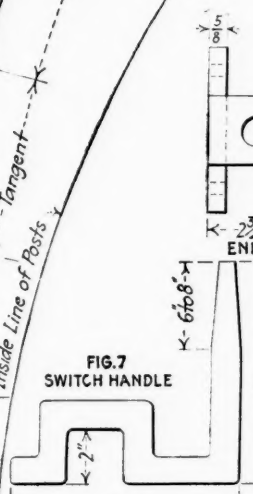


FIG. 7  
SWITCH HANDLE

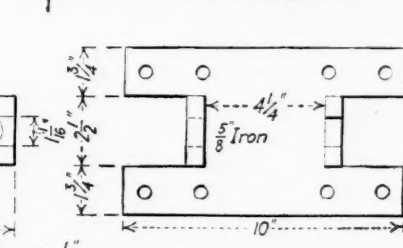


FIG. 6-SWITCH STAND (TOP)

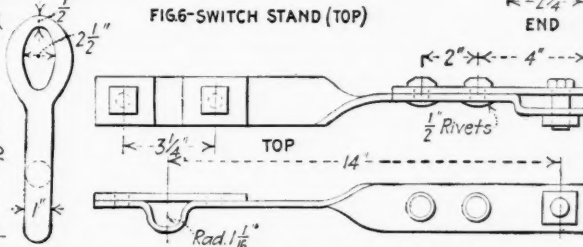


FIG. 8-CONNECTING ROD (SIDE)

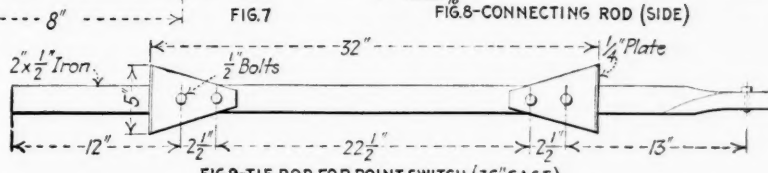


FIG. 9-TIE ROD FOR POINT SWITCH (36" GAGE)

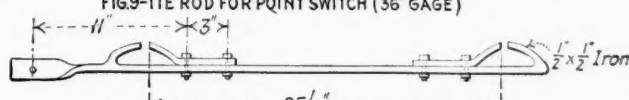


FIG. 10-TIE ROD FOR STUB SWITCH (24" GAGE)

ENGR. MINN. JOURNAL

TURNOUTS USED IN A MINNESOTA MINE

## Record Coal Output of Pennsylvania

The output of bituminous coal in Pennsylvania, according to E. W. Parker of the U. S. Geological Survey, established a new record in 1912 and exceeded the previous maximum of 1910 by 11,343,964 short tons in quantity and by \$16,340,987 in value.

The production decreased from 150,521,526 short tons valued at \$153,029,510 in 1910 to 144,561,257 tons valued at \$146,154,952 in 1911, the smaller production being accompanied by a slight decline in price. In 1912 prices were somewhat improved and the production increased to 161,865,488 short tons valued at \$169,370,497. The gain in quantity in 1912 over 1911 was 17,304,231 tons, or nearly 12 per cent. The increase in value was \$23,215,545, or 16 per cent.

Production increased generally throughout the state, eighteen of the twenty-three counties showing gain, but, as previously stated, by far the greatest increases were in the two counties named. Fayette County showed a gain of 5,756,405 tons and Westmoreland a gain of 6,487,354 tons. The combined production of these two counties in 1912 was 62,956,116 short tons, which exceeded the entire production of Illinois, the third coal-producing state, and was equal to 94 per cent. of the production of West Virginia.

No less notable than the increase in production in 1912 was the extension of the use of mining machinery and a larger tonnage of machine-mined coal. In 1911, the quantity of coal mined by machines was 69,131,923 short tons, or 47.78 per cent. of the total. In 1912, the quantity so mined was 82,192,042 tons or 50.8 per cent. of the total. The number of machines in use in 1912 was 6176 against 5719 in 1911.

Pennsylvania, like West Virginia, presents a commendable record in the small percentage of bituminous coal improperly mined. Of the total production in 1912 only 4,801,784 short tons, or approximately 3 per cent., were reported as being shot off the solid. The quantity reported as mined by hand was 54,545,218 tons, which added to the machine-mined tonnage makes a total of 136,737,260 tons, or 84½ per cent. of the entire production that was undercut, sheared or otherwise mined before being shot or wedged down. The quantity produced in 1912 for which the methods of mining were not reported was 20,326,444, or 12½ per cent. of the total.

Very little of the bituminous coal produced in Pennsylvania is washed before being sold or used in the manufacture of coke. The quantity washed in 1912 was 4,819,330 tons, or 3 per cent. of the total. It yielded 4,326,162 tons of clean coal and 493,168 tons of refuse.

The statistics, compiled by the U. S. Bureau of Mines, show that 437 men were killed in and about the bituminous coal mines of Pennsylvania in 1912, a decrease of 92 from 1911 when there were 529 fatalities.

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## A New Mammoth Breaker

Not content with the largest and most up-to-date breaker in the anthracite field, the Truesdale, the Lackawanna Coal Co. have begun excavations for the foundations of the Loomis breaker, which will surpass all previous attempts in breaker building. The structure, which will be a mammoth affair, will be built entirely of concrete, steel and glass. There will be no lumber used except in

making the falsework necessary in the course of construction. The breaker is to be erected within 1000 ft. of the old Dundee shaft, which was abandoned about 50 years ago because of the inability to cope with the danger surrounding mining at that time. The fact that a new breaker is to be built in this location shows plainly the advance in coal-mining methods in a half century.

The contract was recently awarded to the Walter F. Gahagan Co., of New York. The breaker and washery from surface level to the top of the pocket line will be of reinforced concrete, and from the pockets to the roof, structural steel inclosed by metal and glass. The work of excavation has already begun, and about a year will be required to complete the two buildings. Like the other Lackawanna collieries in the Nanticoke district, the new plant will be operated by electricity furnished by the big Nanticoke power plant. When completed and in operation, the Loomis will give employment to about 2500 men, and will have a capacity of about 6000 tons of coal in nine hours.

Two shafts have already been sunk to the Hillman bed, a depth of 930 ft. below the surface. At the present time the Hillman and Mills seams are being worked. Plans for the sinking of an additional shaft 14x53 ft. 4 in., and about 900 ft. deep, are now under consideration. This shaft will be sunk approximately 800 ft. east of the power plant and will open up virgin territory. The coal will be handled on the surface by 15-ton electric motors.

The old Dundee, which was sunk in 1851, and which for many years has been abandoned on account of the gas, will soon be widened. Its present dimensions are 10x16 ft., with a depth of 810 ft. When the Dundee shaft was in operation there was no such machinery in the anthracite field as a ventilating fan. The shaft is to be extended to the Ross bed, which is about 1500 ft. below the surface, and will be increased in size to 14x43 ft. 3 in.

The steel headframes for Loomis shafts Nos. 1 and 2 are already on the ground, and preliminary work for their erection has been begun. A number of substantial buildings for the housing of engines, etc., erected of concrete and pressed brick are now completed. Two 34x48-in. Corliss-valve hoisting engines have been installed at these openings. They are the products of the Vulcan Iron Works, of Wilkes-Barre, and are equipped with all modern safety devices, such as steam brakes, steam reverse, Welsh overwind device, three throttle valves, one on the main steam line and one on each cylinder. In addition to the above, each cylinder has two relief valves under control of the engineer in case of emergency.

FULL ACCOUNTS OF THE DIFFERENT  
MINE-SAFETY AND FIRST-AID MEETS  
WHICH HAVE BEEN HELD IN VARIOUS  
COAL FIELDS THIS  
MONTH WILL APPEAR IN  
OUR SPECIAL MINE-  
SAFETY NUMBER  
NEXT WEEK,  
OCT. 4.



# Coal Shipping on the Great Lakes

**SYNOPSIS**—A description of the harbors at Toledo and Milwaukee. Toledo is already an important shipping point for bituminous coal and now has improvements under way that will give it the largest capacity of any of the loading ports. Milwaukee is the second largest receiving point and also has important reconstruction of its harbor facilities under consideration.

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## TOLEDO HARBOR\*

Following the completion of the new docks of the Hocking Valley Railroad Co., in East Toledo, this city will rank among the first ports on the lakes in the shipment of coal. Toledo is a natural distributing point for

docks rank third in Toledo and have yard space for 3500 cars. These docks carry a stock of about 80,000 tons of coal and are among the most modern on the lakes.

Bituminous coal alone is handled at the Hocking Valley and T. & O. C. docks, which are splendidly equipped and have a 2500-car capacity. These docks have loading machinery with a capacity of 20,000 tons every 20 hours. The new Hocking Valley docks, now in course of construction, will be open for use, about June of next season, and will be equipped with more loading machinery than any port on the lakes. With the completion of these docks, which will be of concrete and equipped with every modern improvement known, Toledo will take precedence over all other ports as a coal center. All the Hocking



CAR DUMP ON THE HOCKING DOCKS AT TOLEDO



STEAMER "CHAMPLIN," 8500 TONS CAPACITY

coal coming from the South or Southeast for reshipment. It has an aggregate of 12 miles of dockage already developed with an additional 35 miles of available docking sites. During the year of 1912, two million tons of coal were shipped by vessel to up-lake ports, while six and a half million passed through Toledo by water and rail together. All coal destined for Detroit vessels is reshipped at this port.

Toledo has three large docks, the Hocking Valley, T. & O. C., and the C. H. & D. The largest ore dock is that of the C. H. & D.; it is built of concrete and is 1700 ft. long and 433 ft. deep. It is equipped with two 15-ton Hulett fast ore unloaders with a capacity for discharging a 10,000-ton steamer in 10 hr. The C. H. & D. coal

Valley and Chesapeake & Ohio coal, which is now going to Sandusky and other points, will be diverted to Toledo, more than doubling the present tonnage. During last year, 1497 vessels arrived at Toledo and 1477 cleared.

## RAILROAD FACILITIES AT TOLEDO

The railroad shipping facilities here will also be further increased next season by the immense improvements being made at Air Line Junction by the New York Central lines. The yard capacity at that point is being increased to five times and additional shops will also add to the efficiency of the service. The value of this movement to the coal interests will be more apparent when it is understood that Detroit is extremely short of yard space and is in no position to increase its capacity, ow-

\*By E. F. Baker, Nicholas Bldg., Toledo, Ohio.





## PROPOSED NEW DOCKS AT TOLEDO

There are 27 coal-receiving plants along the three rivers and tributary canals which comprise Milwaukee's commercial harbor, with a combined storage capacity of close to 3,000,000 tons. Four of these are private plants connected with local industries. The others do a local and trans-shipping trade. Of the private plants, the largest receives 60,000 tons per season. The fact that several of the leading yards are enlarging and improving their facilities indicates that those engaged in the trade have confidence in its stability and future growth.

The matter of providing more river territory, to accommodate the increasing coal trade, is now receiving the attention of the Harbor Commission, which has recommended that the city proceed at once with the development of the Kinnickinnic Basin and Kinnickianic River. With the completion of a proposed inner basin behind what is known as "Jones Island," near the harbor en-



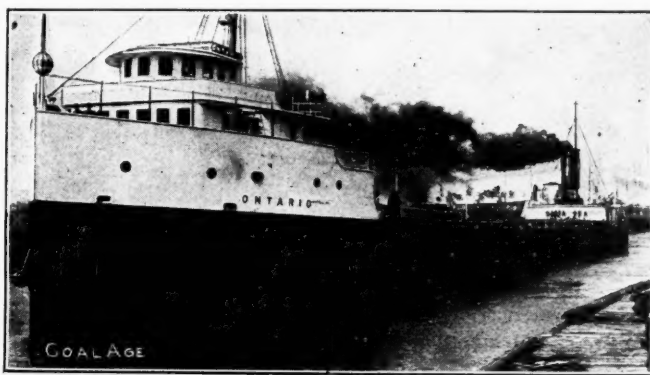
PITTSBURGH COAL CO.'S LOADER AT FAIRPORT, OHIO

trance, Milwaukee will be able to accommodate from 50 to 60 loaded vessels of the largest class with mooring places for the winter; it will thus add to the coal-storage capacity of the port and make it an object for vessel-owners to send their craft to Milwaukee with coal cargoes on the last run of the season. The absence of mooring room has been detrimental to Milwaukee's receipts at the close of navigation, but the proposed improvement will remove this objection and enable shippers to order coal in quantities far beyond the maximum storage capacity of their yards.

Milwaukee is an extensive manufacturing center and consequently is a heavy consumer of steam fuel, while several suburban industrial points also draw heavily upon the coal supply. These facts, together with a large coke- and coal-product plant, which requires about 1,000,000 tons of soft coal annually, makes Milwaukee a con-

sumer of coal to the extent of about 50 per cent. of the total receipts. The remainder is forwarded to points in the interior. The plant alluded to is now erecting an auxiliary establishment at Mayville, Wis., the raw product for which will have to be received at Milwaukee and transferred by rail. This will increase the receipts at that particular dock in the course of a season to nearly half a million tons.

Shippers and dealers report a satisfactory condition of trade, especially in the shipping territory. The consuming area is steadily increasing and orders indicate that buyers intend to be well supplied for the winter.



FREIGHTER "ONTARIO" IN THE CANADIAN "Soo"

The movement is good for the season of the year and it promises to outstrip all previous records by a million tons or more. Between the first of January and the first of September, the gain in receipts over last year aggregates something like 850,000 tons. Even if this high rate of increase is not fully maintained during the balance of the season, it is reasonable to expect that Milwaukee's coal receipts by lake during 1913 will reach the 6,000,000-ton mark.

## COLLIERY NOTES

To clean badly rusted steel tapes, use a mixture of lubricating oil and cement. Do not rub too hard.



An open light should not be taken by the fireboss on his rounds; and to avoid suspicion, the fireboss should wear a cap or hat on which it is impossible to hang the ordinary open miner's lamp.



As far as possible, the use of continuous currents in mines employing over 50 men should be avoided, as not only are the men compelled to breathe impure air by this system, but any fire occurring on the intake would send its smoke all over the mine.



Generally speaking, it is advisable to ventilate the old and abandoned workings. When it is not done, the only proper alternative is to surround the old workings with solid fireproof dams, that is, heavy permanent stoppings of masonry, brick, concrete or other fireproof construction.



The practice of having other engines, such as electric pumping, haulage, etc., in the same engine house with the hoisting engine is responsible for many hoisting accidents, as the noise of the other engines make it exceedingly difficult, if not impossible, for the engineer to hear and attend to the signals properly.

# An Analysis of the Coal-Car Situation

COMPILED BY A. T. SHURICK

**SYNOPSIS**—The beginning of the crop movement and the opening up of the winter coal trade throws the maximum load of the season on the railroads at about this time. Car supply, therefore, becomes an item of serious moment to the producers. A review of the outlook is presented here, together with comments from officials of the leading coal roads. Indications point to a relatively easy situation this year.

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With the nearer approach of the customary car-shortage season, coal operators are naturally interested in what the indications are for this year. It might be well to state here that any prophecies in this connection are subject to impending developments, and furthermore that all the information available in regard to this subject is of a more or less contradictory nature. The most reliable information is, of course, obtained from a study of railroad statistics with special reference to expenditures for additional equipment and motive power, as well as grade elimination, improvement in terminal facilities, etc.

A comparative statement of such data with previous years forms the best available index to the position of the road. The only remaining unknown quantities in the equation are the weather conditions and the increase or decrease in tonnage to be handled.

## THE SITUATION IN GENERAL

The latest accurate statistics regarding equipment and motive power for the entire country are those of the Interstate Commerce Commission recently made public. Unfortunately these are more than a year behind as of June 30, 1912; however, a review of the situation on that date presents some interesting features.

At that time there were a total of 2,368,658 cars on all the roads of the country, this being an increase of only about 25,000 over the statement for the previous year. It is thus obvious that buying new equipment was rigidly curtailed over that period, but such has not been the case during the past year, as will be noted when the statistics become available. Of this gross number of cars in service on June 30, 1912, 2,203,108 were freight cars, 852,720 of these being coal cars. The gross number of locomotives in service on this date was 61,250, of which 36,600 were freight and 9465 switch engines.

The opinion of the average railroad man on the situation appears to be that the deficiency in equipment will be no worse this season than last. The reason most generally advanced for this belief is the broad campaign which manufacturers' associations and civic bodies have conducted and by which shippers and consignees have been impressed with the necessity of rapid loading and unloading of cars. It is interesting to note in this connection that the average trip of freight cars is 14.9 days, during which time the shipper has the use of the car 5.74 days, or about 37 per cent. of the time. This, of course, involves a tremendous loss, which may be materially reduced by coöperation on the part of the shippers.

The Sunset-Central lines, of the Southern Pacific Co., issued an instructive circular offering suggestions for facilitating the movement of freight, which we quote as follows:

1. By giving as much advance notice as possible of your requirements. If there is no suitable car on hand, opportunity should be given to secure it from another point.

2. By calling on the agent for his approval before reloading cars made empty on your tracks. Such cars may or may not properly be used in the direction you desire, and their misuse may necessitate transfer of freight, with consequent delay to your shipment.

3. By loading cars to the greatest possible percentage of their capacity, and by using your efforts with your customers to induce them to place orders for full car loads. If you use two cars to handle the load of one, you reduce the supply 50 per cent.

4. By regulating, so far as possible, your inbound shipments so as to avoid receipt of cars in excess of your ability to promptly unload. Congestions which delay your freight and hurt your business are almost always caused by over-shipments. The effect on the car supply is also obvious.

5. By calling the agent's personal attention at once to any condition which retards the loading or release of cars and which it may be in the power of these lines to correct. Our own deficiencies in facilities or service may be chargeable with a detention for which you are being held responsible.

Orders placed by railroads for new freight equipment during the year have exceeded those for any previous year. The number of new freight cars ordered in this country, Canada and Mexico during the year 1912 aggregated 226,195, or nearly twice that of the previous year. Only in two past years has this been exceeded, that is in 1905 and 1906, when the equipment orders were 341,315 and 310,315, respectively. The following table shows the number of freight cars ordered during each year since 1901:

Year	Cars	Year	Cars	Year	Cars
1901	193,439	1905	341,315	1909	189,360
1902	195,248	1906	310,315	1910	141,204
1903	108,936	1907	151,711	1911	133,117
1904	136,561	1908	52,669	1912	226,195

## STATEMENT OF THE AMERICAN RAILWAY ASSOCIATION

In a review of the situation by the general agent of this association, in *The Railway Age Gazette*, he says:

First, let us ask: What is a car shortage? Is it necessarily a lack of cars? The answer to this, of course, is "No." We have enough cars if we can move them faster. To avoid a car shortage, then, we need either more cars or more movement, and it will be better if we can have both more cars and more movement.

As to the cars, the answer is easy. Last year the roads built 150,000 new freight cars, and this year they are nearly 10,000 cars ahead of their last year's record. Something is being done in this line. What do we mean when we say the movement can be improved? Do we mean that our freight trains ought to be run faster? Any railroad man will tell you no—that to run freight trains faster is not the best way to secure a better movement. He will explain that the freight car is in motion only a small fraction of the time, and that what is needed is more movement of the kind we have now, and not faster movement.

The usual arrangement with train employees is that they are to be paid overtime when the freight train makes less than ten miles an hour. This ten miles an hour is generally accepted as a proper movement for a freight car. At this rate our freight cars in the fiscal year 1910 were in motion one-tenth of the time, and in our record months they were in motion about one-ninth of the time. Certainly there is a chance for more movement of a vehicle which stands still eight hours for every hour it is in motion.

Let us consider who is responsible for car delay. This responsibility is divided between the public and the railroad. Delay by shipper and receiver should be adequately taken care of by demurrage rules, and there is a general impression that on the whole there is less delay by the public than there used to be. Unfortunately, there are no statistics by which this can be proved. The only information which covers the whole of the country is a figure given by the Interstate Commerce Commission of \$7,764,964 demurrage collected by the railways in the fiscal year 1911.



We cannot, therefore, tell how much the shippers and receivers should help us, but we shall know more on this point in the future. Certainly, some of the shippers and receivers made great efforts to secure prompt handling of cars during the car shortage last fall and winter, and we trust they will continue these efforts even more successfully this year.

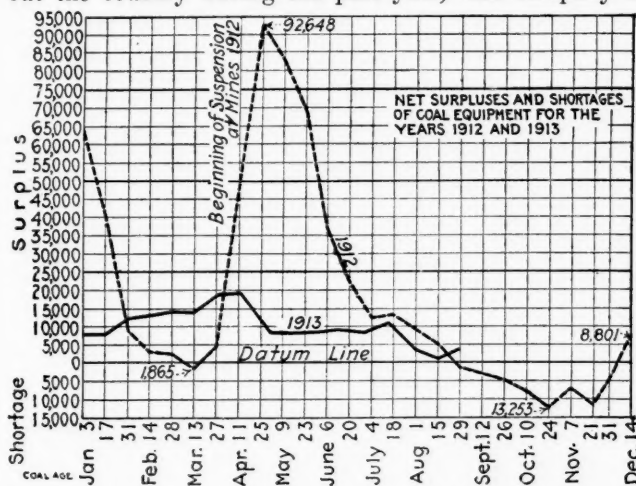
Now, as to delay by railroads, and in this delay I will include shifting movements. As stated above, the railways do not credit themselves with any mileage on account of these shifting movements, and usually the time occupied in a switch movement is much less than the time in which a car stands awaiting such a movement. Delays by railroads appear to be divided into four kinds—delays enroute, delays in yards, delays in shops, and delays in storage, and by this last word "storage" I mean the holding of all available cars for which there is no immediate prospective loading.

The bulk of delay in periods of shortage is to cars standing in yards awaiting movement. This includes both loaded and empty cars. There are cars delayed in this way waiting to go into shops and coming out of shops; cars awaiting delivery to connections, and awaiting movement from interchange tracks, and lastly, and this is probably the most important item, there is a great total of cars, loaded and empty, awaiting road movement, some in terminals and others in yards where engines are changed.

#### CHESAPEAKE & OHIO RAILWAY

Vice-President M. J. Caples, of the Chesapeake & Ohio system, sums up the car situation on his line as follows:

Considering the financial conditions prevailing throughout the country during the past year, this company has



PROFILE SHOWING FLUCTUATIONS IN CAR SUPPLY FOR THE LAST TWO YEARS

made liberal appropriations for the purchase of coal equipment, motive power, passing and yard tracks and for an additional coaling pier at Newport News, Va. There has been put into service 37 Mallet locomotives, having a tractive power of 82,000 lb. each, and 26 Mikado locomotives having a tractive power of 60,800 lb. each. The following is a comparative statement of our coal equipment and motive power for this year and last year:

	1913	1912	Increase
Number of coal cars.....	34,068	32,827	1,241 (3.8%)
Capacity of coal cars (tons).....	1,661,755	1,545,540	116,215 (7.5%)
Number of freight and switching locomotives.....	690	667	23 (3.4%)
Tractive power of freight and switching locomotives (lb.).....	28,695,804	24,730,894	3,964,910 (16.0%)

The condition of our equipment compares favorably with that of a year ago, and with the new cars received and others still coming, we should be able to take care of the shippers on our line. In addition to this, an expenditure of about three-quarters of a million dollars has been authorized for additional passing and yard tracks which will also tend to facilitate the movement.

At Newport News we are constructing a coal pier which, when completed, will be one of the largest and most modern on the Atlantic Coast. It will be 1200 ft.

in length, 70 ft. in width at the water line, and 90 ft. high above high water. There will be 33 pockets on each side of the pier, each having a capacity of 100 tons, and the pier will be capable of handling 72,000 tons per 24 hr. continuous running. This pier is to be completed early in 1914.

#### THE NORFOLK & WESTERN RAILROAD

D. E. Spangler, superintendent of transportation of this road, has furnished us with the following information regarding the situation on his line:

It is difficult to forecast the probable future car supply much beyond the immediate present. With us much of the coal produced on our lines is marketed at different points on other roads. While we have a very large coal equipment, which has been materially increased during the past summer, and to which further substantial additions will be made before the end of the year, we are nevertheless dependent for a full working supply upon the rapidity with which cars are released and returned.

In the fall there is always an appreciable slowing up in the movement of both loaded and empty cars on the Western lines, to which territory the greater portion of our coal goes; the promptness with which the cars are returned depends largely upon weather conditions.

Generally speaking, the Norfolk & Western is well equipped to render prompt service, and with reasonably quick handling on the part of the shipping public and connecting lines, it is felt that this road can provide a good working supply of cars throughout the fall. However, in view of the interruptions to service which the several roads are liable to be subjected to during the winter, and which cannot be avoided, coal consumers should, for their own protection, stock a reasonable tonnage during the summer and fall months. As compared with the increase in coal production, it will be seen that the additions to equipment have been quite liberal, particularly when it is considered that during some of the years practically a full supply of cars was furnished throughout the 12 months.

The increase in the tractive power of our freight engines during the past year has been 14.2 per cent., as compared with 1912, and 36.2 per cent. as compared with 1909. The additions to the coal-car equipment during the current year show an increase of 16.3 per cent. as compared with 1912, and 70 per cent. as compared with 1909. The increase in motive power and car equipment is in direct proportion, it being the policy of the management to do this in order to provide ample power to dispatch promptly all available equipment.

The following improvements and additions have been made or will be completed during the current year: 78 miles of second track; 19 miles of passing track; 25 miles of yard track; a new coal pier at Lambert Point, and numerous shop additions.

The condition of car equipment and motive power is as good as heretofore. The percentage of cars out of service, owing to being out of order, rarely exceeds 5 per cent., and the number of locomotives out of service on that account seldom exceed 10 per cent.

#### COMPARISON OF LOCOMOTIVE AND COAL-CAR EQUIPMENTS

Year	Freight Engines		Coal Cars	
	Number	Tractive Power	Number	Capacity
1909.....	844	27,538,674	21,996	993,080
1912.....	890	32,840,725	29,175	1,451,690
1913.....	951	37,506,784	34,914	1,688,254

(a) Includes new equipment to be delivered to Jan. 1, 1914.

It will be noted that the gross tractive power of the freight engines has been increased 36.2 per cent. since 1909, 14.2 per cent. of which has been added in the past year. The coal-car equipment has been increased 70 per cent. since 1909, the increase in the past year being 16.3 per cent.

STATEMENT OF COAL SHIPMENTS\*

Year	Tonnage	Increase
1909	12,428,385	...
1910	15,783,219	27%
1911	17,424,434	10%
1912	22,028,726	26%
1913†	23,008,258	4%
1913 vs. 1909		85%

\* For fiscal years ended June 30.  
† Ohio flood curtailed output.

## BALTIMORE &amp; OHIO\*

Officials of the Baltimore & Ohio R.R. report that the car-supply outlook for the fall is encouraging and that unless there are extraordinary increases in the volume of business, the requirements will be met more satisfactorily this year than for several seasons.

It is explained in this connection, that with the large purchases of equipment made during the last two or three years, the rolling stock of the company is in good shape to move the fall traffic. The equipment purchased by the road during the last three years includes 25,000 freight cars and 600 locomotives. Most of the motive power bought was for freight service.

Liberal allowances for maintenance of equipment were made during the last fiscal year, the expenditures having amounted to \$18,400,000. During the closing months of the fiscal year, the shops were kept on full time repairing the equipment and it was not until recently that the scale was put back to normal.

The most serious shortages in freight equipment occurs in coal cars and box cars, but no unusual concern is felt in respect to this. It is possible, however, that for a period the coal cars may be supplied on a percentage basis, but it is not expected that such practice will be necessary for an extended time.

New regulations covering the distribution of coal cars were recently issued to shippers by the transportation department and became effective Aug. 1. During extended periods of full car supply, all mines are given up to their orders as far as possible to do so, provided such cars are promptly loaded and consigned. Mine ratings for each operator are based upon the calendar month showing the highest average daily shipments of all mines of such operator during twelve consecutive months ending with the last month for which shipment figures are available. Ratings are revised each month. If the average daily shipments of any subsequent month exceed those of the highest month for which shipment figures are available, shipments of such subsequent month are the rating. Established rating of a mine is the basis for car distribution. Cars are pro-rated on a tonnage basis with a 50-ton car as a unit. One 50-ton car is counted as one car; one 40-ton car, one 30-ton car and one 25-ton car are counted as eight-tenths, six-tenths and five-tenths of a car, respectively.

For several months past, the transportation department, under the direction of C. C. Riley, general superintendent of transportation, has made a scientific study of the car-supply situation. A corps of transportation experts have studied the road's problems with effectual

results, and the expectations are that there will be a saving of several thousand cars during the present season. The studies embrace a careful examination of the method of loading freight, selection of proper cars, packing shipments to prevent loss and damage and the expediting of cars through classification terminals and in the yards.

## NEW YORK CENTRAL LINES

H. J. Merrick, general superintendent of freight transportation, says under date of Aug. 19, 1913: It is a hard matter to anticipate the car supply, months ahead, as so many conditions enter into the problem. It is my thought, however, that the New York Central Lines will have a better supply of equipment than last fall. Everything points to that end, owing to increased equipment and more of our cars on home lines, which was largely brought about by an agreement between the lines in the West, not to misuse open-car equipment, but return them home empty or loaded. So far this year, our mines have had practically 100 per cent. supply of cars, with largely increased production.

There will, without question, be some shortage the last three months of the Lake season, as in previous years. It is my opinion, however, that under normal conditions, our coal-car supply will be better than last or previous years.

## ILLINOIS CENTRAL R.R.\*

There has been a steady movement of coal from the Illinois fields throughout the summer and some sections have shown a fair increase in the tonnage as compared with last year. The indications for the coming fall and winter are for a volume of business equal, at least, to last year, with some signs pointing to increased demand for certain grades, on account of the diversion of some Eastern coals to other markets, creating advanced prices in the West and perhaps for other reasons.

The amount of domestic coal stored by dealers during July and August has been no greater than in former years, and as compared with some, is actually less. Warnings were sent out by the mine operators and railroads and suggestions made to the retail trade and others during the spring and early summer to store as much as possible, but the effect has not been very noticeable. One reason for this may rest in the scarcity and high cost of labor for unloading.

Consumers of steam coal, as a class, do not seem to have grown any more provident, in the direction of insuring against irregularity in the operation of their plants, due interruptions to, and difficulties of transportation as a result of winter weather. It is the same in all localities, including even public service corporations and institutions and buildings that must keep up a steady and continuous fire, or run the risk of financial loss and bodily discomfort for many people. It is rather surprising but none the less true that there are numberless plants that expect the carriers to deliver the daily requirement of fuel with the same regularity with which the dairyman each morning deposits the bottle of milk on the kitchen doorstep, and this regardless of weather conditions, or other difficulties.

Many of the principal coal-originating roads have made material increases during the year, in their power, equip-

\*By Hampton Baumgartner.

\*By C. C. Cameron, Coal Traffic Manager, Illinois Central R.R.



ment and facilities for the handling of this traffic and under the most unfavorable financial conditions that have obtained in years. Notwithstanding this fact, however, a real car shortage is not unexpected, and persons unfamiliar with all the facts, may be inclined to blame the initial carriers. It is also possible that under certain conditions a coal-car shortage may appear to exist, which is, to a large extent, fictitious.

The rating of mines for the purpose of car distribution is based upon the hourly performance, which multiplied by the number of hours in the working day, fixes the car capacity for which the mine may daily order equipment from the railroad. Mines served by two or more roads are permitted to add 50 per cent. to this rating, in ordering cars. It results, then, the potential rating of the mines in a given field for a single day often exceeds the productive capacity for two days, or, in other words, is beyond the real working capacity of the mines, by perhaps as much as 30 or 40 per cent. In case of severe weather, causing increased demand and higher prices, the mines will order their full rating, including those which may have been shut down, or working part time. When this occurs the railroad, while furnishing within, say 15 or 20 per cent. of the actual productive capacity of the field, will be charged with having only 45 or 50 per cent. car supply and blamed accordingly. This, of course, is not fair nor justified by the conditions.

Another difficulty, which the initial roads in Illinois have to contend with, and which amounts to a severe disadvantage at times, is the fact that a very large percentage of the coal mined along their rails, is delivered to the consignees, on other lines. The connecting roads receiving this traffic, furnish practically none of the equipment for its transportation, and on this account a considerable proportion of the initial roads' cars, are on foreign lines at the time when they are most needed at home.

While there has been some improvement along that line, it may be said that generally speaking, very little has been done by consumers in the way of providing for prompt unloading and release of cars; although the proportion of self-dumping cars is constantly increasing, many consignees continue to take advantage of the full time for ordering, placement and unloading.

#### SOME DIFFICULTIES OF THE CARRIERS

The function performed by established and reliable jobbers in finding markets for the operator, and coal for the consumer, is a perfectly legitimate one, and a commercial necessity. In times of stress, however, there appears a class known to the trade as "snowbirds," who are able to do a certain amount of business by making use of the reconsignment privilege. But they greatly abuse this privilege by "kiting" cars from point to point, which adds immeasurably to the carriers' expense and causes congestion and delay. The spectacle is both familiar and discouraging, of cars wanted at a particular mine for shipping to anxious dealers and consumers, while others loaded at this same operation are being jockeyed from station to station by speculative brokers for as long as 30 days before they are unloaded.

It is evidently not generally appreciated that the carriers have not the same ability to move trains and tonnage in severe winter weather that they have at other seasons. When the temperature is low, the snow falling and drifting, and sleet covers the rails and breaks

down the telegraph wires, neither the plant nor the men can work up to normal capacity. It thus frequently happens that for days at a time no more than half the usual tonnage can be handled and double the number of trains is required. These conditions in themselves have a considerable bearing on the movement of both loaded and empty cars and yet it is usually at this time that the heaviest demands are made upon the carriers.

It is true that some coals have better storing qualities than others; but it is also true that practically all the standard grades can be stored for a reasonable time without serious deterioration, if handled with care and properly protected from the sun and rain. But, of course, this involves some expense which the dealer will avoid so long as he can.

As to conditions immediately confronting the coal shipper, receiver and the carriers, cooperation along the following lines will undoubtedly do much toward preventing and ameliorating the severity of a car shortage during the next six months:

1. Ordering no more cars at the mines from day to day than can and will be fully loaded and shipped on the day placed.
2. Loading each car to its full safe carrying capacity.
3. Billing through from the mines to the final consignee and destination, and avoiding reconsignment in transit, so far as may be practicable.
4. Omitting, so far as possible, all unnecessary routing instructions on billing, and leaving it to the carriers to utilize the most available routes, and avoiding points of possible congestion and delay; also avoiding unnecessary roundabout routes.
5. Limiting the amount of coal forwarded on consignment.
6. Unloading and releasing cars immediately upon arrival at destination.

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## The Coal Output of South Wales

A general strike lasting six weeks reduced the output of the South Wales coal field in 1912 by some two million tons, says the *Daily Consular and Trade Reports*, and together with war and other factors produced erratic fluctuations in prices and freight. The quantity produced during the year exceeded 50,000,000 tons, of which 36,000,000 tons were shipped by water. The general average of prices was high, the range for the year being \$4.06 to \$6.57 per long ton, f.o.b. Cardiff, for best admiralty large; and \$2.20 to \$4.24 for best bunker smalls.

The nearly 3000 ovens in the South Wales coal field produce not far from 2,000,000 tons of coke per annum. A growing number of mines producing bituminous coal convert the slack into coke. New ovens are constantly being erected, and there is continuous replacement of the old ones by modern plants, most of which are Coppées. The bulk of the output goes into domestic consumption, the local iron works being the chief consumers.

The surplus for export is increasing, the principal non-British buyers being Spain and the South American countries. Buenos Ayres takes 10,000 to 15,000 tons each year from the ports of South Wales. Montevideo about the same quantity. Rio de Janeiro about half as much. All the ports from Venezuela south take small quantities, totaling more than 100,000 tons per annum. High freights in the last few months of 1912 checked shipments, but under normal conditions coke may be shipped from South Wales to South American ports at \$3.50 to \$4.50 per long ton.

## The Situation in Colorado

Colorado is at present facing an industrial crisis. The state convention of miners recently convened in Trinidad, and after listening to impassioned speeches by such notorious union workers as "Mother" Jones, unanimously adopted a resolution to strike on Tuesday, Sept. 23, unless an agreement with the operators could be reached prior thereto.

The demands made by the miners are seven in number, namely: (1) A 10 per cent. advance in wages on tonnage rates and a daily wage scale on the same basis as that of the State of Wyoming; (2) a 10 per cent. advance on wages paid coke-oven workers; (3) an eight-hour day for all classes of labor in the coal mines and at coke ovens; (4) pay for all narrow work and dead work, including brushing, timbering, removing falls, handling impurities, etc.; (5) check weighmen at all mines to be elected by the miners without any interference by company officials; (6) right to trade in any store that mine workers please, and the right to choose their own boarding place and their own physician; (7) enforcement of the Colorado mining laws and abolition of the guard system, which has prevailed in Colorado for many years.

The strike-call will affect about 9000 men, and 60 mines in Las Animas and Huerfano Counties. It is claimed by the mine workers that they have a fund of \$1,000,000 with which to carry on the strike, and that a monthly assessment amounting to \$350,000 can be levied throughout the country. They also aver that they are ready to shelter miners and their families in tents at the mines, and have leased land for this purpose and the establishment of a commissary.

The operators, on the other hand, allege that probably not more than 10 per cent. of their men will leave the mines for any length of time. They admit, however, that miners as a class are somewhat timid and readily yield to intimidation. They have given their employees every assurance, however, that those who are loyal and remain at their places will be given ample and adequate protection. In substantiation of their belief, they affirm that the delegates who willingly voted the strike order did not adequately represent the miners of southern Colorado, but were, in many cases at least, imported from other districts, or from outside the state in order to further the ends of professional, and to a certain extent, disinterested agitators.

Anticipating serious trouble or rather as a precaution thereagainst, Governor Ammons has instructed Adjutant General Chase to hold the National Guard of the state in readiness for immediate mobilization. The Governor, however, entertains strong hopes that the employment of the militia will be unnecessary, and that an agreement between the opposing factions may be arrived at without disorder.

What the outcome of this difficulty may be, time alone can disclose. Both parties to the strike affirm that the struggle will not end indecisively, but will be carried to the finish, one way or the other. The indications appear to be that the men in the mines themselves do not have any serious grievance against the management, but seem to have been led into the controversy by "missionaries" sent from other states by the United Mine Workers of America.

## King Coal

BY BERTON BRALEY  
*Written expressly for Coal Age*

Kings rule full many a state,  
Armies and ships they command,  
Glory have they that is great,  
Splendor and pomp that are grand,  
Wealth that the universe brings  
Pays to the purple its toll.  
Yet, in the roster of kings,  
Greatest of all is King Coal.

King Coal!  
And whose kingdom is vaster?  
King Coal!  
And the modern world's master,  
Through triumph or blackest disaster—  
King Coal!

Gold rules the markets of men,  
How they have bartered and sold,  
Risen and fallen again,  
All for the glamor of gold!  
Gold is the prize of the game,  
Gold is the ultimate goal,  
Yet—on the roster of fame  
Greatest of all is King Coal.

King Coal!  
He's the miracle maker,  
King Coal!  
He's the wilderness breaker!  
The dreamer—the universe waker,  
King Coal!

Steel has its empire of might,  
Coal is the maker of steel,  
Shaping it, daytime and night,  
Into the sword—or the keel,  
Rousing the magic of steam,  
Driving the world to its goal,  
Making a fact of the dream,  
Greatest of all is King Coal!

King Coal!  
And whose kingdom is vaster?  
King Coal!  
And the modern world's master,  
Through triumph or blackest disaster—  
King Coal!

WATCH FOR MINE-SAFETY NUMBER  
NEXT WEEK

## Exports of Fushun Coal

The exports of Fushun coal now reach about 1,000,000 tons per year, says the *Daily Consular and Trade Reports*. The particulars of shipments and consumption are as follows: To Shanghai, 150,000 tons; Hong Kong and Canton, 150,000 tons; Singapore and Penang, 100,000 tons; Manila, 100,000 tons; Tientsin, 30,000 tons; Government Railways of Japan, 200,000 tons; Korean Railways, 200,000 tons, and North Manchuria, 70,000 tons. The South Manchuria Ry. has now 14 colliers under charter, which are all kept busy carrying Fushun coal to the different ports of consumption.



## POWER DEPARTMENT

### Notes on Rail Bonding

BY VINCENT RHEA\*

**SYNOPSIS**—The comparative costs in power expended with two types of rail bonds are here discussed and the results compared upon the basis of a one-mile track of 40-lb. rails per year.

An important phase of electric haulage systems in mining work is more or less neglected by many mine managers and foremen, namely, the proper bonding of the rails. Apparently the great importance of a well bonded return is not realized by mining men, other than electrical engineers, and until recently there has been little tendency to use anything but the channel-pin and wire method that was in vogue when electric haulage systems were first installed. It is the purpose of this article to show how defective bonding affects the electrical equipment of a colliery and how good bonding may be secured.

The familiar channel-pin method of bonding has but one good feature, the initial cost is low. The solid wire has no flexibility and the constant vibration of the joints either causes the wire to break or the pins to work out from the rails. As it is impossible to obtain an intimate contact between the rail and the channel-pin, corrosion soon takes place and a high resistance in the joint is the result.

Tests made of channel-pin bonds at their installation and three months later showed that out of 40 joints five had a resistance greater than that of a 30-ft. length of rail and the resistance of the balance had increased 100 per cent. Numerous tests have shown that this increase is characteristic of this method of bonding. The effect of this increase in resistance in the return path of the current is to materially lower the voltage.

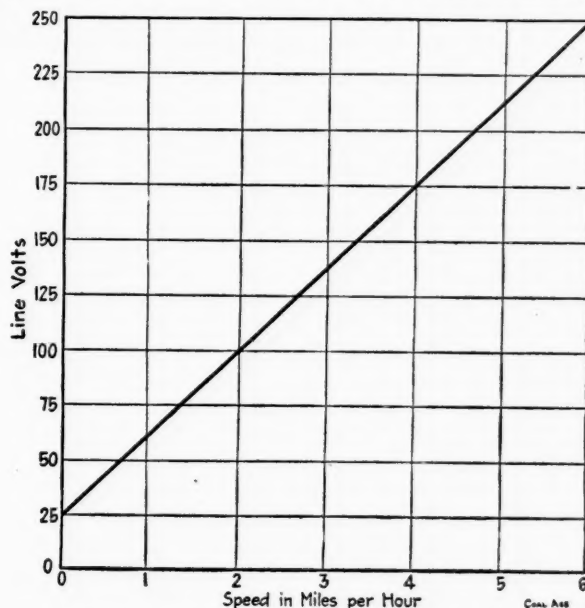
As the performance of standard mine locomotives is based on a certain voltage the effect of a reduction is immediately apparent in the work done by the machine. Assume that a certain locomotive takes 300 amperes at 250 volts to haul a given load at the rate of 6 miles per hour and takes 10 min., actual running time, to haul the trip from the gathering point to the foot of the shaft. Now, if, owing to defective bonding, the line voltage drops to 125 volts, which is not a rare occurrence by any means, the speed of the locomotive decreases from 6 miles per hour to 2.6 miles per hour, and the time to haul the trip from the gathering point to the foot is 22.5 min. instead of 10 min.

The current consumption of the motors is practically the same, 300 amperes. As the thermal condition of the motors is based on the time and the current, it is not surprising that excessive field- and armature-coil "burn outs" are found where the bonding is defective. The period of full-load current is too long, and the motors become so hot that they do not cool sufficiently during the light-load

trip and the insulation is soon damaged and breaks down.

The relation, then, of defective bonding to the output of a colliery and the maintenance of the locomotives is apparent. The motor does not make the number of trips per day that it should. Armature and field repairs are expensive, as every operator knows, to say nothing of the locomotive being out of service at times, due to these troubles.

The generating plant is directly affected by poor bonds. It requires a certain amount of power to overcome the resistance in any transmission system, and the high resistance made by channel-pin bonds in each joint



CURVE SHOWING VARIATION OF SPEED WITH VOLTAGE

in the return side of the circuit means that a certain amount of power is being generated to overcome this resistance instead of being applied to the transportation of coal.

In many cases the power required means a heavy overload on the generating plant. With power at 1c. per kilowatt-hour, the cost of overcoming the resistance of one mile of two 40-lb. rails in parallel for a year of 240 working days is \$15.78 per 100 amperes, assuming that there are no joints. If the 350 or more joints in this mile of rail are bonded with channel-pins the resistance is increased from 75 to 200 per cent. As the power required to overcome resistance is the square of the load times the resistance it can be readily seen that an excessive cost in the power house is a result of defective bonds.

The maintenance of a channel-pin return is high as the bonds have a short life and must be replaced frequently. Motormen will complain of "poor power" and a section of the road will be re-bonded, only to be in bad condition again in a few months. A colliery using this method of bonding has its output limited by the low effi-

\*Scranton, Penn.

ciency of the locomotives and the unnecessary load on the generating plant, and maintenance and operating costs are considerably higher than they should be.

Experience has shown that the best method of securing a return of low resistance for mining work is the use of a flexible cable bond with compressed terminals. This bond is installed outside the splice bar, on the inside of the rail, thus minimizing chances of the bonds being injured by derailment of cars. A small compressor having a power of 25 to 30 tons is used to upset the terminals in the rails.

The result is an almost homogeneous and molecular union between the rail and copper terminal. Moisture cannot enter and the low resistance thus obtained does not vary during the life of the bond. The flexible cable, composed of many fine wires, takes care of vibration caused by trips passing over the joints and relieves the terminals from such stresses. The bond is readily inspected for mechanical injury.

The initial cost of a good bond installation is considerably higher than that for channel-pins, but this expense is offset by the low resistance secured and the long life of the bonds, without any increase in resistance.

Some interesting data, showing what can be accomplished by the use of this type of bonding, have been secured. Tests made at a colliery in Pennsylvania showed that the bonding was so bad that the return current was leaving the rails and finding its way to the generating plant by way of the ditches and water pipes, which, of course, had a high resistance.

The locomotives with a rated speed of 6.3 miles per hour were found to be traveling at about 2.5 miles and making an average of 12 trips per day. The actual load on the generator was 30 per cent. over the rated load on the line. The main haulage roads were bonded with compressed terminal bonds of sufficient capacity to equal the size of trolley and feeders.

The first month following this installation the production was the largest in the history of the mine. The locomotives instead of making 12 trips per day were averaging 18 trips. Later another locomotive was added and the whole load on the generator was less than that carried before the bonding was changed.

At another colliery the bonding resistance of the main haulage road was reduced 80 per cent. by the use of compressed terminal bonds. During the last six months of the channel-pin installation the track bonder had averaged three days per week on this road replacing broken and defective bonds.

During the first seven months of the new installation the bonder spent two hours on the road replacing some bonds broken by a wrecked trip. Numerous other cases could be cited where the output was increased and maintenance and operating costs decreased by the replacing of channel-pin bonds by those of compressed-terminal, flexible cable type.

Any mine manager or foreman who recognizes his own

TABLE SHOWING COST OF ENERGY-LOSS IN RETURN CIRCUIT PER 100 AMPERES LOAD, PER YEAR OF 240 9-HOUR DAYS, POWER COSTING ONE CENT PER KILOWATT-HOUR.

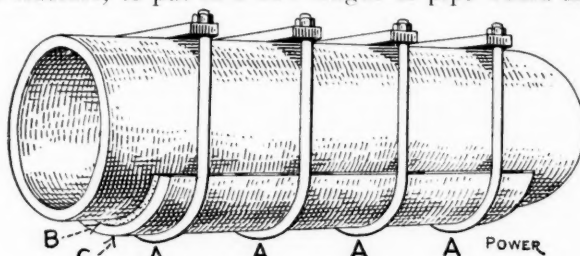
One Mile. Two forty-pound rails in parallel, assuming continuous joints	\$15.78
One Mile. Two forty-pound rails in parallel, bonded with channel-pin bonds, resistance found by actual test.	37.80
One Mile. Two forty-pound rails in parallel, bonded with compressed terminal bonds, resistance found by actual test.	17.99
Fixed cost of rail resistance.	15.78
Increased cost with compressed bonds.	2.21
Increased cost with channel-pin bonds.	22.02
Saving per year with compressed bonds for power alone per 100 amperes.	19.81

conditions in those mentioned in this article and wants to get better results from his electric haulage system can rest assured that this is possible by the use of good bonds.

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## Stopping a Bad Leak

The 4-in. suction pipe leading from a pond to the circulating pump froze and burst, says Earl Pagett, in *Power* for Aug. 26, 1913. As there was no union near the fracture, to put in a new length of pipe would mean



HOW THE LEAK WAS STOPPED

to take up the pipe from the pond to the fracture. The illustration shows how it was repaired. A.A.A.A are U-bolts, B is a gasket and C is a piece cut from a pipe of slightly larger diameter than the pipe to be repaired.

DON'T MISS READING THE SPECIAL  
MINE-SAFETY NUMBER OF COAL AGE  
WHICH WILL APPEAR NEXT SAT-  
URDAY, OCT. 4. THIS SPECIAL  
ISSUE WILL BE THE MOST  
INTERESTING WE HAVE  
EVER PUBLISHED.

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## Mine-Safety Meeting in Pittsburgh

The second meeting of the American Mine Safety Association was held at Arsenal Park, and the Fort Pitt Hotel in Pittsburgh, Monday, Tuesday and Wednesday of this week. About forty first-aid teams from coal companies located in various parts of the United States participated in the contest.

Many valuable prizes were distributed in the evening after speeches delivered by notable men. Several of the most celebrated mine surgeons in the country were present and took part in the discussion relative to first-aid methods. James Roderick, chief of the Department of Mines, in Pennsylvania, and Earl Henry, chief of the Department of Mines, in West Virginia, were in attendance with a number of their deputies.

One of the interesting exhibits was the mine-rescue automobile truck belonging to the Birmingham station of the Federal Bureau of Mines. This car is said to be capable of traveling 35 miles an hour in responding to a call for help, in case of a mine disaster. The new truck is believed to be an improvement over the rescue cars, now in use by the Federal Bureau.

A full account of this meeting, as well as the *Miners' Field Day Meet*, held at Knoxville, Tenn., Sept. 20, will be printed in our special "mine-safety" number next Saturday, Oct. 4.



## EDITORIALS

### Strikes and Their Cause

When we analyze labor conditions the world over and then compare wages abroad with those that American workmen receive, we are forced to the conclusion that dissatisfaction and strikes are not alone due to the pay a man gets for his labor.

That great majority of humans who work with their hands are fast coming into their own, if they have not already arrived there. The danger is, will they stick to the highway of reason and right, or be piloted to a disastrous finish by some of their unscrupulous leaders whose chosen profession is the exploitation of their fellow men.

Time was when capital believed it best to hold workmen in a state of ignorance for fear that the acquisition of knowledge might shed a light on the injustice being done them; but that day has passed, and the safety of the future lies in a campaign of enlightenment, whereby the workingman is taught to think for himself. Such men will recognize *only* proper leaders and will not attempt to change conditions of a century in the lapse of a night.

American coal owners have naught of which to be ashamed. Our miners are the best paid in the world. It is not at all unusual for a good worker to draw from \$100 to \$125 for four weeks' labor. Even negro miners in West Virginia at the present time are earning as high as \$140 in a month. We know of one "darky" who earned \$148 in July; a Greek, 68 years old, earned \$86 in 18 days; two Italian youths, 19 years old, made \$90 each in 17 days; and a Hungarian earned \$121 in 18 days.

Compare such conditions with those that exist in Great Britain, which is again on the verge of a national labor war. Think of 480,000 British railroad employees receiving an average wage of only \$6.42 per week. Last year in the United Kingdom there were 900,000 paupers in spite of the old-age pensions. Nearly a million men and women over 70 years of age are on the pension roll for \$1.25 a week apiece.

In such a country, where national success is only attained by forcing a scale of wages so low as to menace the freedom and citizenship of the people, we are not surprised that a great and serious industrial adjustment should take place through ever-recurring strikes. 'Tis better so, than that millions of deserving people should face a hopeless future of hardship and suffering.

But in this country things are different, and still we have equally as much labor trouble as our British cousins. We may continue to add increase after increase to the wages of workingmen, and still we will have strikes aplenty. There is but one solution—education. We talk of "safety first" and our great corporations are spending thousands of dollars in this praiseworthy work, but American industry, mining and otherwise, will not be placed on a proper efficiency basis until the boss and his men understand each other.

The menace of business today is the dishonest professional agitator. It is these parasites that must be eliminated. Unionism properly conducted is all right, and no employer who is just and fair wants such confederations abolished. However, it is essential to stable progress that the men have leaders who will fight their battles honorably and not betray them.

Any business that must be conducted on lines of secrecy is unfit to exist. Any company that cannot confide in its employees and survive their scrutinizing gaze deserves no consideration in the final accounting. If all the miners in this country were encouraged to take a greater personal interest in the affairs of their employers, they would not be so ready to respond to the appeals of agitators who harangue them from street corners.

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### First-Aid Judging

It is well known that the judging at first-aid meets may be divided into two classes: Inadequate judging by competent judges, and adequate judging by incompetent judges. In the anthracite regions, the former prevails, and in the bituminous-coal fields the latter.

Both forms of judgment are so unfortunate, undesirable, provocative of wrath, and subversive of discipline that we are not going to decide between them. We propose only to state the issue, and gracefully "dodge the bricks."

Of course, it is easy to say that every meet should have such a large number of competent judges present, that every event may be umpired completely from start to finish. But unfortunately doctors are busy men, and often when not actively engaged are detained by prospective cases. Moreover it is hard to secure enough of these who have made a sufficing study of first-aid. So it is difficult to secure enough medical men to act as umpires.

Of lay judges, little can usually be expected. Managers of coal mines rarely spare sufficient time to learn the many details of first-aid to such a degree that they are more proficient than the men they judge.

In the anthracite region, it is the custom for a few judges to go round after the maneuvering and bandaging are all done. There is no attempt to find out *how* the work has been performed; the result is all that is sought. A rapid declaration of the manner of execution on the part of the captain informs the judges in general of what has transpired and reveals principally whether the team took the most important step first.

But every physician and every layman knows that unless a moving picture were taken of the team in action, no body of men, however skilled in first-aid science, could hope to judge of the work by any such method. No pretense is made of supervising resuscitatory work or the loading of stretchers. A hasty action which the position or tightness of no bandage can exhibit or a false movement which the report of the captain fails to reveal might give more agony and do more harm to an injured man than the action of the team might remove and yet those

faulty pieces of technique would not offend the judgment of the surgeon who made the final examination.

True, the doctors are watching and see perhaps more than is supposed, but very many errors in practice are committed which they never see. How can a mere quarter dozen of men watch effectively about 50 teams of six men each, all in action at one and the same time, three hundred possible offenders violating any one of perhaps twenty different rules. Thus the means is sacrificed to the end so that the team and even the training physician learn to belittle a knowledge of those details which do not have to be stated to the examining physicians.

But what, on the other hand, can be said as to the line up of laymen in the bituminous meets, who frequently award one hundred marks in every event, whose liberality is only exceeded by their lack of knowledge of the science of physiology and of the art of healing.

If any solution of the vexed problem of judging at first-aid meets is possible, it is this: Competent laymen should be appointed to watch the manner of execution, there being perhaps one to each team. Medical men should be the critics of the condition of the victim after the event is completed.

Certain mistakes should be left to the laymen for penalization; demerits for other faults should only be imposed by the examining physicians. The doctors could help the laymen decide whether any actions they have observed are deserving of penalties.

Neither the practice of the hard-coal nor the methods of the soft-coal regions are to be commended. There would be merit, however, in a skillful blend.

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### Oil in the Boiler

In many plants, especially those which operate condensing or where open feed-water heaters are used, drawing their steam supply from reciprocating engines or pumps, oil in more or less quantity finds its way into the boilers along with the feed water. This introduces an element of danger which is worthy of no light consideration and which may take two forms of manifestation.

Oil in a boiler, particularly if it be of animal or vegetable origin, is apt to cause foaming or priming to a more or less marked degree. This, however, is seldom detrimental to the boiler itself unless it becomes so violent and prolonged as to lower the waterline below the point of direct heat from the furnace. It is, however, usually cylinder oils that find their way into the boilers, and these are almost always of mineral origin.

It is this type of oil that is a source of real danger to the boiler itself. As is well known, oil has a marked tendency to adhere to and thinly coat the boiler surfaces. This film of oil effectually prevents the water from coming in direct contact with the metal of tubes or sheets. Small particles of scale-forming matter are attracted by this oil and with it from eventually a coating which is thoroughly impervious to the water. The latter is thus prevented from rapidly abstracting heat from the shell or tube, as the case may be.

The heat of a boiler furnace may be and frequently is well up around 2,000 deg. F. and unless the boiler tube or shell is effectually cooled from the inside when subjected to this high temperature from without, the result is obvious—the material will stretch, due to internal pressure, and eventually give way.

In water-tube boilers the presence of oil not infrequently causes a tube failure, which although decidedly less dangerous than the rupture through bagging of the shell of a multitubular boiler, is nevertheless not infrequently accompanied with disastrous results.

When for purposes of scale softening, we intentionally introduce crude oil into our boilers, we at least know of its presence and its approximate amount; in other words, we are forewarned not only of its existence in the boiler, but of its quantity, and can act accordingly. When, on the other hand, oil finds its way, through inefficient or defective separating apparatus, into the boiler along with the feed water, the danger which its presence entails is doubly perilous, because it is unsuspected.

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### Supervision of Miners

Under this title, in another column, in the discussion of means and methods for producing greater safety in mines, a correspondent has suggested among other things a closer supervision of miners by deputy foremen. He suggests that each deputy foreman have charge of a prescribed district of the mine, for which he be held responsible in respect to the safety of the men, the methods they employ and their behavior in the mine. The suggestion is drawn from the practice in vogue in the north of England.

We are glad to note in this connection that the Lehigh Valley Coal Co., one of the largest coal-producing companies in the northern anthracite valley of Pennsylvania, has practically adopted this method of a closer supervision of miners during working hours. In common with other companies, it has been the practice in the Lehigh Valley mines, for the assistant mine foreman to make a thorough inspection of the mine each morning, and having warned the men of any existing dangers and recorded same, to leave the mine to the general supervision of the inside foreman.

Under the system recently adopted by the Lehigh Valley Coal Co., there has been a redistribution of responsibility. The fireboss makes his usual examination in the morning, while a number of assistant foremen are authorized to supervise the work of the miners and inspect their working places closely throughout the day. Each assistant foreman is held responsible for the safety of the men in his district, which is small enough to enable him to give the necessary attention to every detail. We are glad to say that the system has proved a success. It is patterned along lines similar to that described in *COAL AGE*, Apr. 5, p. 539. Chief Mine Inspector J. B. McDermott, of Montana, there drew attention to the systematic division of labor recently put in operation in the mines of the second-largest-coal-producing company in that state. By the system described, each class of work is in charge of men especially authorized and instructed in its performance. All shots are prepared and fired by shotfirers; trackmen lay all tracks and switches, the timbermen set all timbers. The system is reported to have produced an increased efficiency and economy in working. We believe there is no question but that greater attention will be given to such systematic arrangements in mining work, in the future, than ever before.



## The Value of Study to Mining Men

BY SAMUEL M. McMAHON\*

I have been much impressed recently with the need of closer study on the part of mining men and, particularly, mine officials. Much of our work is performed in a routine, matter-of-fact manner; and to most of us the daily task becomes quite ordinary because we fail to think deeply and appreciate the great laws and principles involved.

As a brief illustration, I may ask how many of us stop to consider what a wonderful thing it is to breathe, see, hear, taste, smell and move from place to place. The body performs unconsciously the various functions involved in each separate act. We are not impressed with these wonders because they are continually with us, performing their regular tasks with ease and requiring no attention.

But the most perfect physical health and strength are attained only by a thorough knowledge of the laws of nature that control the physical life. It is the same in all professions: the doctor must be familiar with the human body, its composition and the effect of drugs; a lawyer must be intimate with Blackstone and have a thorough knowledge of technical law; the clergyman must study and know bible history; the merchant must educate himself along commercial lines. Likewise, in every walk of life, success depends on an intimate knowledge of the laws and principles that govern one's work or trade. Men who possess such a knowledge are the masters of the situation.

But, admitting the need of knowledge, the question uppermost in the mind of the practical man and, particularly, the mine foreman, is how this is to be attained. Tired with the day's work, the idea of study or mental effort at night is irksome; unless a thorough-going interest in the daily work in the mine serves to make a chapter from a book on mining or a few pages in a mining journal as much desired as the newspaper. The trouble is that we submit too much to the routine and monotony of life; we get in a rut; we read the daily newspaper as a habit; but we fail to devote a proper portion of our spare time to secure the advancement that is essential to success. The well balanced successful man is the one who mixes work and enjoyment in their proper proportion.

What study did for Lincoln, Hugh Miller and others, it can do for our mine superintendents, foremen and fire-bosses. The great Scotch geologist, Hugh Miller, left early in life with the care of his mother, was the son of a sailor. Fortune made him a stonemason; but study and application developed the famous geologist who later became the author of many books. Miller said: "The best schools I have attended are the schools that are open to all; the best teachers I have had are easy of access to all, though severe in their discipline. My success as a pupil was my inclination to learn; and there are few of the natural sciences that do not lie as open to the working men of America and Great Britain as geology did to me."

By the same study and application, coupled with an inclination to learn, men of all classes can fit themselves for higher positions. I have quoted the words of Miller,

\*Superintendent, West Virginia-Pittsburgh Coal Co., Wellsburg, W. Va.

because he had few advantages and received his education in the woods, under the earth, studying the trees and brooks and observing natural laws. In closing, let me say that mine foremen, because of their responsibility, have greater need to study than most other men. Theoretical, as well as practical mine foremen, are in demand. Try the plan of reading for self improvement and the habit will grow.

## Coal Production in Illinois

The following summary shows the relative figures for the years ended June 30, 1912 and 1913, respectively. The figures include the local mines and show that coal was mined in two less counties, and that the total number of mines has decreased from 879, in 1912, to 840 mines, in 1913; the shipping mines show a decrease of nine. The tonnage for 1913, however, shows an increase over 1912 of 4,331,964 tons, or about 7.5 per cent. The total tons mined for the year ended June 30, 1913, is 61,846,204.

The number of persons employed in and around the mines has increased slightly; the increase being only 86 above that in 1912. The number of fatal accidents for 1913 is 177, or three less than for 1912, while the nonfatal accidents have increased from 800, in 1912, to 1030, in 1913.

There are a number of reasons that can be advanced for this increase in nonfatal accidents, which will be explained fully in the Annual Coal Report.

### ILLINOIS COAL STATISTICS

Summary for the years ended June 30, 1912 and 1913.

	1913	1912
Number of counties producing coal.....	50	52
Number of mines and openings of all kinds.....	840	879
New mines or old mines reopened during the year....	85	176
Mines closed or abandoned since last report.....	124	142
Total output of all mines, in tons of 2,000 pounds....	61,846,204	57,514,240
Number of shipping or commercial mines.....	371	380
Total output of shipping mines, tons.....	60,515,416	56,096,695
Number of mines in local trade only.....	469	499
Output of local mines, tons.....	1,330,788	1,417,545
Total tons of mine-run coal.....	14,979,990	13,336,509
Total tons of lump coal.....	20,850,125	21,795,527
Total tons of egg coal.....	6,819,980	4,940,431
Total tons of nut coal.....	3,130,065	3,193,956
Total tons of pea coal.....	13,734,537	11,109,191
Total tons of slack coal.....	2,331,507	3,108,626
Total tons shipped.....	55,972,374	51,502,382
Tons supplied to locomotives and rail cars.....	904,570	924,854
Tons sold to local trade.....	2,345,233	2,615,678
Tons consumed (or wasted) at the plant.....	2,624,027	2,471,326
Average days of active operation for shipping mines.....	179	172
Average days of active operation for all mines.....	170	160
Number of motors in use.....	466	381
Number of mines in which mining machines are used.....	139	139
Number of mining machines in use.....	1,661	1,581
Number of tons undercut by machines.....	30,228,520	25,550,019
Number of tons mined by hand.....	31,617,684	31,964,221
Average number of miners employed during the year.....	35,401	39,149
Average number of other employees underground.....	35,662	31,687
Average number of boys employed underground.....	1,430	1,526
Average number of employees above ground.....	7,004	7,049
Total number of employees.....	79,497	79,411
Average price paid per gross ton for hand mining.....	\$0.664	\$0.636
Shipping mines.....		
Average price paid per gross ton for machine mining.....	\$0.521	\$0.496
Number of kegs of powder used for blasting coal.....	1,308,381	1,313,448
Number of kegs of powder used for other purposes.....	3,685	3,040
Number of pounds of permissible explosive used.....	603,420	328,075
Number of men accidentally killed.....	177	180
Number of men injured so as to lose a month or more time.....	1,030	800
Number of gross tons mined to each life lost.....	349,414	319,524
Number of employees to each life lost.....	449	441
Number of deaths per 1,000 employed.....	2.23	2.26
Number of gross tons mined to each man injured.....	59,922	71,893
Number of employees to each man injured.....	77	99

## Legal Department

In this section of our paper next week we will print a discussion relative to "Removal of Coal through Adjoining Land." It will be shown that *the proper basis for valuation of a right-of-way is damage to landowner and not benefit to operator.* A number of recent coal-mining decisions will also be published next week.

## SOCIOLOGICAL DEPARTMENT

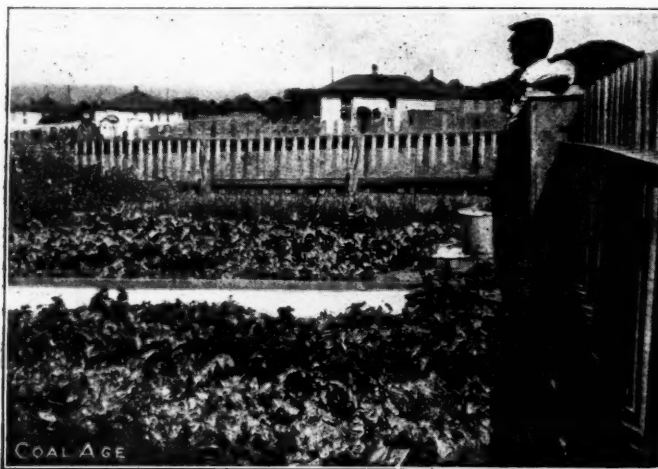
### Gardens in the Arid West

By F. W. WHITESIDE\*

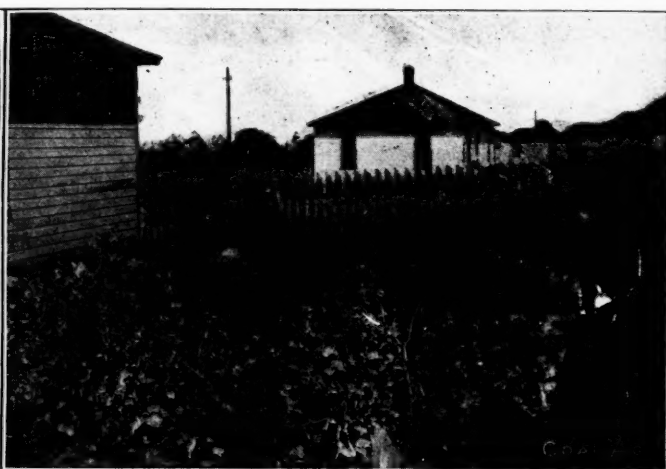
When visiting many of our coal-mine towns, especially in the western portion of the United States, the visitor is unfavorably impressed by the prevailing absence of neatness. The great American tin can is strikingly in evidence while ash heaps, rubbish, scrap iron and broken-

so pleasant a cast that the visitor is tempted to tarry long in the place.

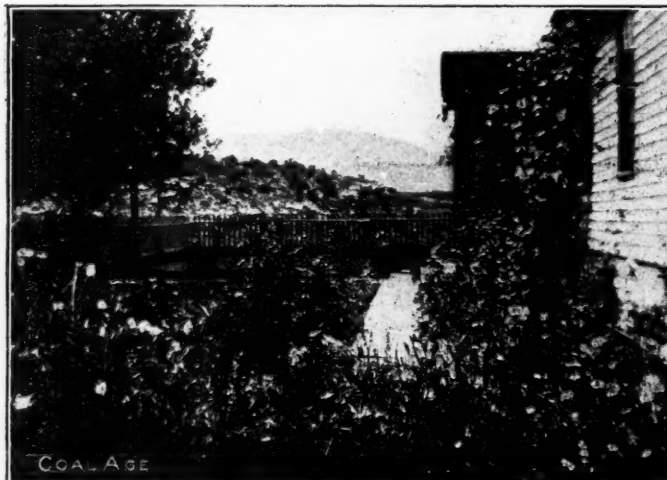
In localities where water is scarce, where it must be hauled from some distant source by car or wagon tank, a landscape of vines and flowers is not to be considered. In such a place the closest approximation is a yard neatly fenced and all traces of weeds and rubbish eliminated. It might be asked if it is worth while to go to the ex-



1ST-PRIZE GARDEN AT HOUSE NO. 52, RAVENWOOD



2ND-PRIZE GARDEN AT HOUSE NO. 56, RAVENWOOD



1ST-PRIZE LAWN AT HOUSE NO. 47, CHANDLER



1ST-PRIZE GARDEN AT HOUSE NO. 47, CHANDLER

down or cast-off machinery are scattered promiscuously about the village.

With few exceptions, the yards and roads about the dwelling of the miner are without tree or shrub. An occasional weed alone relieves the craving of the eye for something green and flowering. The fences about the cottages are either entirely wanting or in a sad state of repair. Taken altogether the picture presented is not alluring and the impression left upon the mind is not of

pense of building a fence to inclose a barren and unproductive yard. It appears, however, that unless a lot has some definite boundary line, the matter of up-keep is left to Mother Nature and the gentle breezes.

I well realize that, in many mining towns, especially in the long-established districts of the Eastern and Central States, neatly fenced yards are the rule rather than the exception. These remarks are directed toward those localities where the miner lives in a "coal camp." The term camp here being used in its original and primitive sense.

\*Chief engineer, the Victor-American Fuel Co., Denver, Colo.



Man is greatly influenced by his environment. If physically and morally good, it so casts a refining influence upon him. All the great corporations have come to realize this fact. Their employees are provided with playgrounds, swimming pools, rest room, amusements, libraries, theaters and schools. If the workman is educated and entertained he will become more efficient and contented. This is axiomatic.

unacquainted with the occupant of the house on whose yard he was passing judgment, it is fair to assume that the decision was just and impartial.

Only two of the company towns had sufficient water this summer to participate in the contest, the season being exceptionally dry, irrigation water was not available in sufficient quantity at the balance of the company's properties. Next year it is hoped that with perhaps two



CHANDLER SCHOOL HOUSE  
NOTE NEATNESS



2ND-PRIZE LAWN, HOUSE  
No. 74, CHANDLER



SUPERINTENDENT'S HOUSE,  
CHANDLER

It now follows that the miner, being provided with all or many of these good things, will devote more interest and labor toward improving the condition of his home and its surroundings. The first step is a neat house and a well kept yard. The next is a tiny garden with a flower or two. The last step is to cover all the available yard space with flowers, lawn and garden.

In order to stimulate a healthy interest in this direction, J. C. Osgood, chairman of the board of the Victor-American Fuel Co., of Denver, personally offered three cash prizes of \$25, \$15 and \$10 for the prettiest yard in each of the company's mining towns, where irrigation was possible.

At Chandler, near Cañon City, the subject of lawns and gardens has been given attention for several years, so that much was to be expected from it. At Ravenwood,

exceptions, all the Colorado division mines will be represented.

The awards were as follows:

	Chandler	Ravenwood
First prize, \$25.	August Hudder.	John Happs.
Second prize, \$15.	R. F. Perrine.	Frank Nodeck.
Third prize, \$10.	James Rampone.	W. S. Smith.

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## The Tenderfoot

That accidents are largely due to inexperience is illustrated by the story of John Karpi, a Finnish miner, who recently commenced his first shift at the International Coal Co.'s mine at Bearcreek, Montana.

Instead of carrying his powder under his arm he placed the keg on his shoulder when he started up the



3RD-PRIZE GARDEN, HOUSE No. 53, RAVENWOOD

near Walsenburg, a more modest start had to be made, as some of the soil had never before been broken for cultivation and it was an interesting and somewhat amusing spectacle to see some of the contestants attacking the hard-packed earth, with a pick, in the endeavor to soften it sufficiently so that they could dig it with a spade.

In order to secure fair and impartial judgment, when the yards were ready for the awards to be made, a judge, having knowledge and experience in gardening, was selected from one of the larger towns nearby. As he was



3RD-PRIZE GARDEN, HOUSE No. 26, CHANDLER

slope. His keg touched the electric-transmission wire and a flash resulted followed by an explosion.

Karpi was not killed and managed to walk to the mouth of the slope, but an anæsthetic, a stiff brush and some sterile bicarbonate of soda will be necessary to make Karpi a good looking Finn again. A mule which stood by was burned even worse than the miner.

With all the stolidity of his countrymen Karpi thought his experience a good joke and appeared at the drift mouth with a broad grin over his blackened countenance.

## DISCUSSION BY READERS

### Mixed Lights in Mining

*Letter No. 16*—I have had some experience with mixed lights in coal mining and was greatly interested in the discussion on this subject. I would advocate the use of mixed lights in any mine where gas is only found in certain districts, or at the head of an entry, or at the face of a room, or in some old workings, providing the fireboss or mine examiner knows his business thoroughly and is a conscientious man and one who can be depended on to put up the necessary fences and danger signs.

Suppose, for example, gas makes its appearance at the head of an entry; this entry should be put on safety lamps at once. It should then be fenced off a sufficient distance back from the gas, to prevent any person from approaching the face with an open light. In such a case, the fireboss must keep a close watch over the place and examine it often, as well as all adjoining places.

It is well known that safety lamps are only safe in the hands of experienced persons. It may happen that 50 per cent. of the persons working in a certain mine have never used a safety lamp before and do not know how to handle such a lamp even after being instructed. After letting a lamp fall, an inexperienced person will often try to light the lamp before it has been examined to see that it is safe. Many have a habit of tilting the lamp on one side, or raising the wick too high, in order to get a better light. On these accounts, the danger is often increased by the use of the safety lamp.

A number of explosions have occurred in mines where safety lamps are used exclusively and I venture the remark that such explosions have been more frequent than where mixed lights are in use in a well regulated mine. If a miner is so ignorant as to cross a fence or a dead line, with an open light, he is liable to prove a dangerous man with any kind of light and should be sent out of the mine.

The law in Alberta requires that the ventilation in mines shall be sufficient to dilute and render harmless noxious gases to an extent that all working places in the mine shall be fit to work in and travel through with safety. The law specifies that where safety lamps are used in any part of a mine, no naked light shall be used in any other part of that mine situated between the place where the safety lamps are in use and the return airway. If these laws are enforced the volume of air in circulation will be sufficient to permit of the use of open lights even in some places generating a little gas.

I agree with John Rose and would use mixed lights under the conditions stated in the last part of his letter (No. 14, COAL AGE, Sept. 6, p. 354.) In Letter No. 15, on the same page, John A. McDonald, in speaking of the use of mixed lights, states: "There will always be fear of some careless or reckless person, with an open light on his head, setting off some gas and causing a violent explosion; whereas, if safety lamps were used exclusively, this could not occur." I want to say that the same careless, reckless person would be just as lia-

ble to cause an explosion if required or permitted to use a safety lamp. If he would risk going into gas with an open light he would no doubt take greater chances with a safety lamp; and if the lamp was not properly handled or was defective a disaster would result.

GEO. WM. HALLIDAY.

Commerce, Alberta, Canada.

*Letter No. 17*—The several letters published recently in COAL AGE, relating to the use of mixed lights in mining, have been both interesting and instructive. I have been surprised, however, to see how many of the writers whose duty it is and should be to guard the lives of miners, seem to consider the use of mixed lights in gaseous territory, as not a serious matter.

It has frequently happened that the antipathy of miners in respect to safety lamps, together with a lack of moral force on the part of mine officials in this regard, has brought disaster to both. The knowledge that the miners are opposed to the use of the safety lamp has deterred many mine officials from adopting them, when their better judgment has dictated otherwise.

I regret to say that on the part of many miners there is an uncanny idea associated with the use of the safety lamp, the repugnance possibly arising from the danger the presence of the lamp in the mine suggests. In some cases, a safety lamp in the hands of a mine official creates uneasiness and a feeling of alarm, which is manifested by remarks passed from one to another, such as "A body of gas has been found somewhere; something has gone wrong, etc."

To a large class of miners, the safety lamp suggests danger, just as would the presence of an open light, in the mind of an intelligent mine official. This is particularly true in respect to the foreign element. Where a change from the use of the open light to that of the safety lamp is made necessary, instead of this being regarded as a wise precaution, it suggests to many a present danger. The dread of an explosion, on the part of many, causes an exodus from the mine.

In addition to the danger the presence of the lamp suggests, the antipathy of the miner is due largely to the dim light it affords and the inconvenience of handling the lamp owing to its size and shape. There is also the fear of losing the light and not being able to relight the lamp, besides the prohibition of smoking where this lamp is used. For these reasons, many miners, perhaps a majority, prefer to run a considerable risk rather than be compelled to use a safety lamp.

After all that has been taught and demonstrated, in reference to the ignition of gas and dust, there arises the question, in the thoughtful mind: Why should a risk be run that is unwarranted? Why should there be hesitation in the adoption and use of safety lamps when conditions demand that they be introduced? Every practical miner realizes, if he will admit the fact, that, in a territory producing an almost undetectable amount of gas, there is always the possibility of an outburst of gas from the strata, that cannot be foreseen but which



would suddenly transform the mine from a safe to an alarmingly dangerous condition. Also, an unexpectedly dangerous condition may result from a breakdown of the ventilating apparatus, a heavy fall of roof in the air course, the setting open of a door, or a sudden fall of barometer, or any one of a number of other causes known and unknown.

In most cases, the mining law draws a narrow enough margin of safety, which should not be reduced but rather expanded, for the greater protection of life and security of property. While, in many cases, there has been a disposition to encroach on the requirements of the law (and this goes without saying), I am glad to say that many of the larger companies have established high standards of safety by widening the law's margin in respect to all possible danger. Where the law winked at the practice of mixed lights, these companies have become a law unto themselves and abolished the practice. Where the law was satisfied with a stipulated amount of ventilation, they have doubled and trebled that amount, in order to increase the security of the mine.

A brief review of recent catastrophes in mines operating in gaseous territory and under the mixed-light system, cannot but convince any unprejudiced mind that immunity from disaster is impossible under such conditions. The purchase of a few score of safety lamps of an approved type is not a matter of financial embarrassment; but the neglect to do this and thereby avoid a possible danger may cause ruin, besides producing untold misery.

Where entries develop gas, there should be no temporizing, but an approved type of safety lamp should be adopted at once; or, if preferred, an approved form of electric light should be used throughout the mine. The electric lamp does away with the miner's chief objection to the safety lamp; namely, the dim light it affords. In regard to the electric lamp, I feel safe in predicting that, not in the remote future, miners will demand its general adoption, in gaseous mines and in all mines. The use of this lamp will practically eliminate the question of fire in stables and other parts of the mine where timbers, brattices and other inflammable materials are exposed. In my opinion, the passage of laws in every mining state, that would make compulsory the use of the electric lamp in mines, would be a benefit and a blessing. This suggestion may seem radical, but it has the redeeming quality of being made in all sincerity.

CHARLTON DIXON.

Pittsburgh, Penn.

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## The Safety Lamp and the Eyesight

I have seen numerous references to this subject, in previous issues of COAL AGE, but the question as to whether or not the continued use of the safety lamp impairs the miner's eyesight and finally curtails his producing power appears to be unsettled. While the opinions of miners who have had the same number of years' experience in the use of the safety lamp differ widely, the preponderance of sentiment so far expressed seems to strongly favor the negative side of the controversy.

While acting in the capacity of mine foreman and fireboss, I was compelled to use the safety lamp constantly for several years and am forced to agree with Messrs. Sutton (Vol. 3, p. 1008), Virgin (Vol. 4, p. 244), Ho-

garth (p. 278) and Fireboss (p. 170), who have stated that, in their opinion, the constant use of the safety lamp has no ill effect on the eyesight of the miner.

My experience of eight years, in a mine operated with open lights, followed by an experience of 13 years in the same mine operated exclusively with safety lamps, has given me the opportunity to observe closely what effect, if any, is produced by the constant use of the lamp. As a result, I am convinced that the eyesight of miners is not impaired by the constant use of safety lamps. I believe there is greater danger of injury to the eyesight, by the use of large lamps burning inferior oil. The heat and smoke from an open light produced by the burning of an impure oil together with the unsteady nature of the light is, in my opinion, more harmful to the eye than the small steady light of the safety lamp.

I frankly admit that the safety lamp is not as convenient as the open light, which the miner carries on his head, and that it is, to some extent, a burden to the miner, in the performance of his work. However, my experience and observation convince me that the use of the lamp does not perceptibly reduce the man's producing power. It may require a little more effort on the part of the miner to work with a safety lamp; but miners have loaded as many cars of coal and timbered their working places as well when using the safety lamp as when the open light is employed. While this statement may seem a little unreasonable to one with but a limited experience in the use of the safety lamp, it will not appear so to the man who has been long accustomed to its use. This, however, is the result of my observation and experience with both lamps.

JOHN ROSE,

District Mine Inspector.

Dayton, Tenn.

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## Supervision of Miners

I was much interested in the foreword of July 12, which described a method of checking off every man as he enters or departs from the mine. The system is good as far as it goes and is in force, at present, in most of the mines in this state. It is open to the objection, however, that much time may elapse before it is considered necessary to look up a man whose check is still out. There may be no particular alarm felt at the man's home or boarding place, perhaps, until he is an hour behind his usual time of returning from work. In some cases, even then, it is necessary to send for the foreman or one of his assistants, if no one is stationed at the mine entrance charged with the duty of checking off each man as he goes out of the mine.

In my opinion, a far better system is that which has been employed for many years in two of the northern counties of England; namely, Northumberland and Durham. It is my belief that, for efficiency, economy and safety, that system cannot be surpassed. The mine is divided into districts and a deputy in charge of each district, is held responsible for the safety of the men in that portion of the mine. He must examine each working place before shifts and meet his men at the foot of the shaft when they go to work. If they are working in gas, he must examine their lamps and instruct them in reference to any danger that may exist in their several places.

It is the duty of each deputy, during working hours, to supply all timber and tracking needed in his district. He must see that each place is timbered securely and that this timber is recovered, as far as possible, when the place is finished. The deputies practically work the mine; they start and stop all working places. At the end of each shift he must see that every man and boy, in his district, have left the mine and gone home. If any fail to appear on time, he looks them up at once.

In this connection, the article on the Prevention of Accidents in Coal Mines, by John McNeil, in the same issue, p. 42, is interesting. It contains many wholesome truths and good suggestions; but, after all, the method of supervision that I have described as in use in England is a better plan. The deputy is there to instruct and supervise the miner and better results are obtained both in respect to safety and the output of coal, while the cost of timber and other supplies is much reduced.

I wish now to refer to a feature of mining work that is quite common in the North of England and to which Mine Inspector J. B. McDermott has referred as having been adopted by the second largest producing mine in Montana, in his excellent letter, No. 12, Vol. 3, p. 539, when discussing the question of post timbering at the working face. I have reference to the division of labor in mines, whereby all shots are prepared and fired by shotfirers; trackmen lay all tracks and switches; and timbermen

are employed to set all timbers. In the North of England a miner is not allowed to touch a car, but the driver takes it out of the room and puts another car in *its place*. This method has the advantage that a miner is not obliged to leave his room, at a time when he should attend to setting a post or sprag to prevent a fall of roof or coal. A miner may have a bad piece of top that needs a post set at once; but just at that time the driver comes in for his car and the miner must go out and bring in his empty. Other things may delay him and, perhaps, on his return in a half hour or less, the roof has fallen and must be removed, which means much extra work on the part of the miner. Then, probably, the timber he was about to place when called away by the driver, will be too short and he must hunt a longer stick.

It is the lack of systematic arrangement, in the work of mining, that brings poor results and increases the number of complaints that appear so often, to the effect that the returns from capital invested are small. The question of the division of labor should receive careful attention at the hands of all mine operators and superintendents; and every effort should be made to systematize and regulate the work so as to obtain the highest degree of efficiency from the workmen. This is being done in all industries to a greater extent than in coal mining.

WILLIAM COULSON.

Spring Valley, Ill.

## Study Course in Coal Mining

BY J. T. BEARD

### The Coal Age Pocket Book

#### HYGROMETRY

Hygrometry is the measurement of the amount of vapor in the air, at any given time. The capacity of the air for holding moisture varies with the temperature. For example, at 32 deg. F., a cubic foot of air will hold or has a capacity of only 2.13 grains of water; while at 60 deg. the capacity is 5.77 gr. per cu.ft.; at 100 deg., 19.84 gr. per cu.ft.; and at 212 deg. F., air fully saturated with moisture holds about 258 gr. per cu.ft.

**Hygrometric State of Air**—Air absorbs moisture from bodies in contact with it, and thus exerts a drying action, which is of great importance in mining. The absorptive power of the air varies with its degree of saturation. For example, air at 60 deg. F., containing, say 2.9 gr. per cu.ft., is only about half saturated and is then said to contain 50 per cent. of moisture. In this condition, the air will readily absorb more moisture. The degree of saturation of air is called its "hygrometric state."

Air is said to be "dry" or "wet," according to the degree of its saturation. It is important to observe that these terms have no reference to the actual amount of vapor present in a given volume of air; but only express how nearly the air is saturated. For example, air fully saturated at 32 deg. F. contains 2.13 gr. of moisture per cubic foot and is "wet" because it is full of water vapor; but if the temperature now rises to, say 60 deg., the vapor capacity of the air is thereby increased to 5.77 gr. per cu.ft., and its degree of saturation or "humidity" is then  $2.13/5.77 \times 100 = 36.9$  per cent. In other words, the air at this temperature contains only 36.9 per cent. of its capacity, and is therefore comparatively speaking, "dry" air. Owing to the rise of temperature, from 32 to 60 deg., the air is capable of absorbing  $5.77 - 2.13 = 3.64$  gr. of moisture per cubic foot.

**Calculation of Weight of Moisture in Air**—In order to calculate the weight (w), in pounds, of moisture contained in one cubic foot of air, it is necessary to know the degree of saturation of the air (c), its temperature (t), and the vapor tension (tv) corresponding to that temperature. This last must be taken from tables known as psychrometric tables. Calling the absolute temperature  $T = 460 + t$ , the formula is

$$w = 0.6235 \frac{c t^2}{0.37 T}$$

The constant 0.6235 is the specific gravity of water vapor, and the constant 0.37 is the reciprocal of the weight of one cubic foot of dry air, at a temperature of 1 deg. F. (absolute) and a pressure of 1 lb. per sq.in.

**Example**—Calculate the weight of water vapor carried in an air current of 100,000 cu.ft. when the saturation is 80 per cent. and the temperature 70 deg. F., if the vapor tension at the given temperature is  $t_v = 0.3602$ .

**Solution**—The absolute temperature, in this case, is  $T = 460 + 70 = 530$ ; and the total weight of vapor is

$$100,000 \times 0.6235 \frac{0.80 \times 0.3602}{0.37 \times 530} = 91.62 \text{ lb.}$$

### The Coal Age Pocket Book

**How Humidity Is Measured**—The humidity of the air is commonly measured by an instrument called the "hygrometer" or "psychrometer." This is the "wet-and-dry-bulb hygrometer."

Other forms of hygrometer have been employed depending on the absorption of the moisture from the air by certain hygroscopic substances, and dew-point hygrometers; but these are less simple and not as portable as the wet-and-dry-bulb hygrometer, which indicates the humidity by the difference in the reading of the wet-and-dry-bulb thermometers.

**The Hygrometer or Psychrometer**—A neat and portable form of the wet-and-dry-bulb hygrometer, designed by the Davis Instrument Manufacturing Co., is shown in the figure. Two delicate thermometers are mounted on springs on the inside of a light cylindrical folding metallic case, the dry bulb on the door and the wet bulb in the case. To the latter bulb is attached a fine silk or muslin sack, which forms a wick that extends downward to the small vessel which holds the water that keeps this bulb wet.

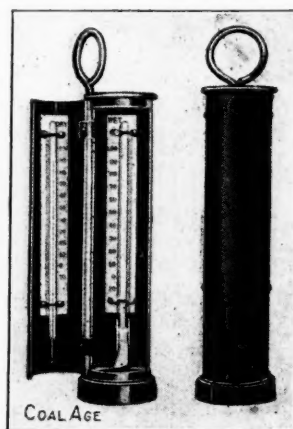
**Principle of Hygrometer**—Unsaturated vapors, like gases, obey Boyle's law; and, for any given temperature, the ratio of the quantity or volume of vapor is equal to the pressure ratio, or the relative humidity (H), as expressed by the formula

$$H = \frac{\text{Actual vapor pressure}}{\text{Saturated vapor pressure}}$$

The saturated vapor pressure (dry-bulb temp.) is given in the tables. The actual vapor pressure, at the time of observation, is equal to the saturated vapor pressure of the tables, for the dew-point temperature, which, if known, would make the calculation easy by the use of the above formula. In the use of the wet-and-dry-bulb hygrometer, however, the relative humidity is calculated by the formula

$$H = \frac{P_w - \frac{B}{30} \left( \frac{t_d - t_w}{88} \right)}{P_d}$$

in which H = relative humidity;  $P_w$  and  $P_d$  the respective saturated vapor pressures of the tables, for the corresponding wet-and-dry-bulb temperatures  $t_w$  and  $t_d$ ; and B the barometric pressure, in inches.



A POCKET HYGROMETER



## EXAMINATION QUESTIONS

### Miscellaneous Questions

*Answered by Request.*

**Ques.**—What is the least amount of cover you would allow in the extraction of pillars in a 7-ft. seam of coal, in under-sea areas? Show proof that your answer is approximately correct.

**Ans.**—The question appears to be incomplete, since it does not give sufficient data in regard to the character of the overlying strata or the depth of the water above the solid formation. Without accurate information in this regard and a knowledge or acquaintance with the action of the roof in the particular locality, it would be difficult to give an intelligent answer to the question and to name the minimum amount of cover, for any assumed thickness of strata; much less to give proof that such minimum thickness is even approximately correct. The allowable thickness of cover must be judged largely by the careful observation of working conditions and experience in the district.

While it is possible to assume that the strata overlying the coal seam consist largely of shales and sandstones, with a total thickness of not less than 60 ft. of shale, which is more dependable than sandstone, and to fix the total minimum cover or thickness of overlying strata at, say 300 ft., it might happen that other unfavorable conditions not mentioned in the question, existed, which would make the proposed thickness of strata unsafe. The question is not, therefore, one that should be asked in an examination, but must be left to be settled by the practical judgment and experience of the men in charge.

**Ques.**—What horsepower will it take to raise 60,000 gal. of water up a shaft 250 ft. deep, in 1 hr., allowing 25 per cent. for resistance in the pump and the pipes?

**Ans.**—The weight of 60,000 gal. of water, allowing eight and one-third pounds per gal., is  $60,000 \times 8\frac{1}{3} = 500,000$  lb. Assuming a loss of 25 per cent. in friction, the power effective for lifting the water is  $100 - 25 = 75$  per cent. of the total power required. Therefore, the horsepower necessary, in this case, is

$$\frac{500,000 \times 250}{60 \times 33,000 \times 0.75} = 84 + hp.$$

**Ques.**—Assuming a volume of 25 cu. ft. of gas in the face of an entry when the reading of the barometer is 30.7 in., how will this volume be affected if the barometer falls to 29.9 in.?

**Ans.**—Assuming that the temperature remains unchanged, the volume of gas or air expands in inverse proportion to the pressure; in other words, the volume ratio is equal to the inverse pressure ratio. Calling the required volume of the expanded gas  $x$ , we have:

$$\frac{x}{25} = \frac{30.7}{29.9}$$

and  $x = \frac{25 \times 30.7}{29.9} = 25.66 \text{ cu. ft.}$

**Ques.**—(a) Disregarding friction, what is the theoretical velocity of air corresponding to a water gage of 1.75 in.? (b) What is the pressure corresponding to this water gage?

**Ans.**—Since water is practically 815 times as heavy as air, the head-of-air column corresponding to a 1.75-in. water gage is  $1.75 \times 815 \div 12 = 118.8$  ft. The theoretical velocity of air corresponding to this head-of-air column is:

$$v = \sqrt{2gh} = \sqrt{2 \times 32.16 \times 118.8} = 87.4 \text{ ft. per sec.}$$

**Ques.**—In case a squeeze occurred in a mine of which you had charge endangering a heading and threatening to shut off a part of the work, how would you proceed to stop its progress?

**Ans.**—Much will depend on the conditions existing in the mine. The principal cause of a squeeze occurring in mine workings is the maintaining of too large a standing area, especially when the pillars are too small for the support of the overlying strata. When the pillars are insufficient or the open area is too large, the weight thrown on the pillars crushes the coal and starts a squeeze.

It is much easier to prevent a squeeze from starting than to stop one already in progress. To prevent such an occurrence, it is necessary to leave large pillars that will be sufficient to support the increased weight thrown on them by the extraction of the coal from the rooms. Also, in drawing pillars it is important to pull all timbers so that the roof will fall and thus relieve the pressure on the pillars.

In case a squeeze has started, the best way to arrest its progress is to rush work on the pillars and draw all timbers in abandoned places so as to start heavy falls of roof, in the path of the squeeze. Where possible, an attempt should be made to break the roof over the entry pillars, by placing shots in the roof, just inside of the mouth of each room. At important points on roadways, it may often be possible to build substantial "cogs," so as to reinforce the pillars at such points. This is also done in rooms to protect them from closing. The most effective method, however, is to relieve the pressure on the pillars by causing heavy falls of roof in all abandoned places adjacent to the squeeze.

**Ques.**—What must be carefully considered before the work of drawing the pillars is commenced?

**Ans.**—Before starting the work of drawing back pillars in a section of the mine, it is necessary to consider the effect this work will produce both on the surface and in the mine. Regard must be had to the future work and whether or not the drawing of the pillars will endanger the roads leading to other sections of the mine, or the work in those sections. It is also possible that the drawing of pillars may cause an inflow of water or gas into the workings that would prove a menace to the safety of the mine and this must, therefore, be taken into consideration before attempting to draw the pillars in any particular section of the mine.

## COAL AND COKE NEWS

### Washington D. C.

Within a short time probably a strong effort will be made to get Congress to adopt legislation giving the Interstate Commerce Commission power to completely control the physical equipment of railroads as well as to prescribe the condition in which they should keep their roadbed, trackage, stations, etc. Representative Stevens of Minnesota, an influential member of the House Committee on interstate commerce is behind the plan and it is understood that the scheme is supported by a number of Democratic members of influence.

The idea would be to enable the Commission to add this branch of labor to the powers it now exercises not only with the purpose of increasing the safety of passengers but also for the purpose of enabling it to end the so-called car shortage abuse.

As is well known, the Commission has conducted elaborate inquiry into car shortage during the past year, and it is claimed that the car shortage has been found to be due not only to actual scarcity of cars, as is frequently the case, but also to bad distribution or rolling stock, due in part it is alleged, to a disposition to favor given shippers. Particularly is this thought to be the case with regard to coal cars as to a shortage in which complaints have been numerous and constant for some time past.

The Commission has not had much success in enforcing its various orders with regard to the distribution of cars, various mines being said to have failed to get the quota to which they were entitled, or at all events to which they thought they were entitled.

A good many bills are now pending before the House Committee on interstate commerce with regard to the equipment question, many of them extreme and absurd in their nature, and some intended to deal directly with the alleged shortage of freight cars, including coal cars. The Committee is already making preparations to deal with the question of railway legislation at the approaching winter session, it being stated that the demand for further restrictive and repressive legislation has become irresistible, so that the legislative managers cannot afford to oppose it but must assent to the demand for doing something.

It is stated that the Stevens bill transferring the jurisdiction over the equipment question to the Commission would be more conservative by far than the adoption of measures prescribing in absolute terms what the railroads must do. In speaking on this point, Mr. Stevens says:

Congress is too slow-moving a body to handle this question adequately. We are always ten years behind the times. The railroad problem should be solved by a small body of experts who are making a life study of it, rather than by 435 members of Congress who know nothing about the subject technically. Fifty bills are now pending in Congress on this subject. The way to deal with the problem is to turn the whole question over to the commission with power to act when occasion demands.

In spite of the relative conservatism which is thought to characterize Mr. Stevens' proposal, it seems to find no favor whatever with the railroads but the information coming to hand is that they intend to oppose the scheme. Full hearings will be granted on the subject and it is believed that they may be undertaken shortly, without waiting for the winter session to begin, as Congress has now largely reconciled itself to the idea of remaining in session until almost December.

If this plan is followed, the effect may be to finish the preliminary work before the winter session technically begins, and thereby to render it possible to start the actual discussion of what is to be done with the equipment problem at the opening of the session.

The equipment discussion is likely to be closely associated with a debate on the rate question in which, a considerable proportion of attention will be given by Massachusetts members and others closely affected, to the question of how far present prices for coal are due to existing freight rates and how far the situation can be remedied through the adoption of proper legislation.

#### Investigating Experts Report

The Committee of special investigating experts appointed by Census Director Harris some time ago has completed its preliminary investigation of conditions in the Census and

has made recommendations to the director. A part of these recommendations deals specifically with conditions as to the statistics of mining.

The Committee found that the current understanding with reference to bad conditions in the census was by no means exaggerated but that the Bureau was practically in a state of disorganization and ineffectiveness while it has violated the law by delaying census statistics far beyond the time when they were to have made their appearance. After outlining the situation and detailing the circumstances now obstructing work, the committee says:

We therefore advise the Director to begin no new tabulations or analyses in connection with the unfinished branches of the Thirteenth Census, namely, population, mining and quarries and to readjust the work of these branches on the delayed annual reports so as to insure their publication not later than Dec. 31, 1913. Further on the investigators suggest "That the tables relating to mines and quarries now in the form of printed bulletins, proofs, or manuscript be sent to the public printer at once, the same to constitute the final report on mines and quarries, and that no further tabulations or text be prepared in connection with that report."

If these recommendations are carried out, they will end the further development of the mining census which has been generally conceded to be nearly as worthless as such an enterprise could well be, particularly in its relation to coal mining. The general opinion appears to be that the co-operation between the Census and the Geological Survey in regard to mining figures, which had been expected to yield beneficial results has been of no service in improving the data finally secured.

#### Coal Trade Changes Due to New Tariff

As a result of the new tariff, now practically law, in which is carried as paragraph 459 in the free list the following: "Coal anthracite, bituminous, culm, slack and shale; coke; compositions used for fuel in which coal or coal dust is the component material of chief value, whether in briquets of other form," it is expected that coal trade with Canada will be greatly altered in direction.

Considerable importations are expected to cross the border into the United States both from the eastern and western mines while on the other hand our export trade in coal to Canada via the Great Lakes is expected to be considerably enlarged, as well as probably in other parts of the country. The precise changes that will be produced in this way are, however, not yet known, and experts are still uncertain as to the precise direction they will take.

#### HARRISBURG, PENN.

Actual returns compiled by field secretaries of the Mine Workers Institutes demonstrate that the fast growing mine schools of the anthracite region of Pennsylvania have fully proved their worth. Of the 56 candidates who presented themselves for the state examinations for certificates in Nanticoke Borough and Newport Township this year 4 of the 7 successful candidates for mine foremen's and 24 of the 37 successful candidates for assistant mine foremen's certificates were students of the mine schools.

At Mt. Carmel where the schools have not been in existence long none of the students were sufficiently advanced to present themselves for examinations. One mine foreman's certificate and 6 assistant mine foremen's certificates were granted at this year's examinations.

Of the 27 candidates who presented themselves for the examination at Shamokin, 2 of the 8 successful candidates for mine foremen and 4 of the 14 successful for assistant mine foremen's certificates were students of the mine schools.

The foregoing proves conclusively that the mine schools, which open again next month, are adequate to equip men for the examinations and for better paying positions. A summary of the above returns shows that students of the schools were granted 6 mine foremen's and 28 assistant mine foremen's certificates, which is a good showing for the schools.

#### Mining Institute to Open in October

At a meeting of the board of directors of the Wilkes-Barre District Mining Institute it was decided that the institute be opened the second Saturday in October. Secretary Devendorf made a report of the institute dinner held in May and reported that at present there is a membership of 1140.



The arrangements for the meetings of the institute for the coming winter were left in the hands of Mr. Devendorf. The November meeting will be devoted to the foreign speaking members of the association.

#### Work of Public Service Commission

The Public Service Commission of Pennsylvania has announced that the experts engaged on the inquiry into the rates for hauling coal from the anthracite collieries to Philadelphia have found that the work is greater than expected, but that a report will be filed shortly. The detail work is well advanced and an outline will soon be submitted to the commission, showing the charges and hauls on each railroad running into the anthracite territory.

The Commission will hold a hearing on Friday, Sept. 26, on one of the complaints concerning the rate on shipments of bituminous coal from the Clearfield district to York and Lancaster. On the same day the commission will give hearing to the Bell Telephone Co. on the tentative schedule of rates as published by the old Railroad Commission.

#### Reorganization Helps

A redistribution of responsibility, together with some increase in the number of assistant foremen, has been effected in the mines of the Lehigh Valley Coal Co. in the anthracite region. The former system was for the "fire-bosses," now known as assistant foremen, to make a thorough inspection of the mines each morning, as prescribed by the Anthracite Mine Laws, to warn the men of all dangerous spots, and to take whatever precautions were necessary to render the mines safe during the day; and then to leave the mines under the general supervision of the inside foreman. The driver bosses in charge of transportation only had no authority over the men, and could only caution them and report to the foreman whatever they saw that looked dangerous or wrong.

At present the mines are divided into districts, each one small enough to be patrolled easily by an assistant foreman, with time enough for him to stop and see that his orders are thoroughly carried out. The morning inspection before the men enter the mines is carried on as carefully as ever, but now the assistant foremen with authority over the men continue the inspection each in his own district throughout the working day. Each one is responsible for safe conditions in his district, and reports to the inside foreman. There are no more driver bosses, each assistant foreman being held responsible for the transportation through his district.

This system has been found to be a success, according to officials of the Lehigh Valley Coal Co., and has added greatly to the safety of the men who were prone formerly to forget the instructions of the fire-bosses and take a chance, when left to their own devices in order to hurry through the work.

#### PENNSYLVANIA

##### Anthracite

**Hazleton**—Orders have been issued by Kehoe & Co. which brought about a suspension of two of their big stripping operations. The suspension is due to the scarcity of water which has been prevalent in the Mahanoy Valley for several weeks. The company operates two big strippings, one at Packer No. 5, Lost Creek, and the other at Sayre, near Mt. Carmel. For the past two weeks operations have been hampered by the diminished water supply, but as long as it lasted the men were kept employed in the hope that a heavy rainfall would occur, eliminating the necessity for suspension. However, the drought has become so pronounced that it was found compulsory to close down the operations. About 70 men are affected.

**Fern Glen**—The miners at Fern Glen, an operation owned by the Lehigh Valley Coal Co., are on strike. The breast miners claim that it is their desire to buy their dynamite by the box, but that they are allowed only 3 lb. a day by the company, while the company miners get theirs by the box.

**Plymouth**—The Lance No. 11 Colliery, of the Lehigh & Wilkes-Barre Coal Co., which closed down on Aug. 8 in order that necessary repairs might be made to the shaft, breaker and engines, will soon be ready to resume operations. A concrete lining has been built in the shaft, from the surface to the rock, about 13 ft. Iron doors are to be placed over the shaft mouth as a protection against fire, the breaker being directly over the shaft. In a short time compressed air locomotives are to be put in service inside, the compressor engines being already in place on the surface.

**Pittston**—A squeeze in the workings of the Butler Colliery, of the Pennsylvania Coal Co., caused the bank of the old Hughestown reservoir, owned by the Spring Brook Water

Supply Co., to give way, and the water rushed down to Mill St. and other thoroughfares in that section, causing considerable damage. The water flowed out of the reservoir through an underground channel, the stone walls holding firmly against the pressure. Part of the water went down into the mine, while the stream that took the surface course was much smaller.

#### Bituminous

**Indiana**—A large field of coal lying on the Indiana County side of the Conemaugh River, east of Garfield, is being taken up by Westmoreland and Fayette County coal operators. The field is a large one and adjoins land recently taken up by the Frick interests, who are interested in brick manufacturing concerns located at Bolivar. The extent of the operations have not been decided, but a large block of coal has been taken up. The output of new mines, which will be located some distance from Garfield will be shipped over the Pennsylvania R.R. The spur to the new mines is so located that it will be possible to ship either over the Penn or Conemaugh Division or over the main line to points East.

**Johnstown**—George Ringler, aged 53, was killed when a steam pipe exploded in the power room of the Brothers Valley Coal Co. Ringler was killed instantly and another workman was badly scalded. The boilers were being prepared for inspection when the accident occurred.

**Uniontown**—There has been a considerable awakening of interest of late and no little inquiry for good coal land, and prices are buoyant. Uniontown men have been taking options for some weeks on the Pittsburgh vein of coal underlying farms in the vicinity of Ten Mile and Hackney in Washington County. The prevailing option price is said to be \$600 per acre. It is said also that blocks of land of considerable size will likely change hands under the options now being secured. Brokers claim, however, that practically all large areas of coal available for operating in Allegheny County are controlled by the big corporations, so that the marketable supply is small.

#### WEST VIRGINIA

**Charleston**—The petty strike fever which has long vexed the Anthracite region seems to have been transplanted into the West Virginia coal fields. The men employed at the mines of the Eureka Coal Co. on Morris Creek, near Montgomery recently went on strike because a motorman was discharged. Five hundred men have been on strike for a short time on Paint Creek. Miners who are employed by the Edward Marmet Co. on Lens Creek have also been on strike. All of these contentions have been of a somewhat trivial nature and at the present time all the miners have returned to work. In order to cope with this situation President Thomas Cairns of District 17 United Mine Workers of America, has issued an ultimatum stating that "no more strikes will be tolerated unless ordered by proper authority." Resorting to petty strikes, he affirms is ruinous to the miners' cause and to the interests of the operators.

Coal operators with mines along the Chesapeake & Ohio, Kanawha & Michigan, Virginian and Norfolk & Western R.R. met in Charleston, Sept. 19 and organized an Operators Protective Association. A fund of \$1,000,000 is said to have been raised to protect the interests of the mines in this organization.

#### KENTUCKY

**Frankfort**—Suit has been filed in the United States District Court, by J. W., A. W. and Hattie Sewell asking for a receiver for the properties being operated for coal and oil on Caney Creek by the Kentucky Block Cannel Coal Co., S. R. Collier and several others, being made defendants. The receivership is asked pending the settlement of a controversy as to the title, which is claimed by both plaintiffs and defendants. The Collier interests are said to be taking 1000 barrels of oil a day out of the property, while the coal rights are equally valuable.

**Pineville**—Many of the mines in the vicinity of Pineville, have been operating on a half-time basis, on account of the drouth, while a few have been compelled to shut down completely. Several recent light rains have given hope that relief is in sight, however, as there is now ample moisture in most parts of the state. Heavy orders are on hand, and over-time operations will probably be the rule as soon as there is sufficient water available for the work.

**Dekoven**—President L. B. Walker, of District 23, United Mine Workers of America, has declared a strike at the Dekoven mines in Union County, the matter under dispute being the disposition of unclaimed cars of coal finding their way out of the mines to the check weighman. Under an agreement with the operators it is claimed by the men that such

occasional unclaimed cars were to have gone toward paying the wages of the check weighman, but that this arrangement has been discontinued.

#### OHIO

**Columbus**—It is rumored in railroad and coal mining circles that the southern division of the Detroit, Toledo & Ironton may be abandoned. The property was recently sold at receiver's sale and a considerable amount was required from the contractor to bind the agreement. After investigation it was found that the road was losing practically \$45,000 per month and the purchasers have been loath to consummate the deal. Operators on the road have filed many complaints with the Public Utilities Commission as to lack of equipment and motive power.

John C. Davies, chief deputy in the mine inspecting department of Ohio in his report made to Governor Cox predicts that the year 1913 will be the banner year in Ohio's coal production. The state mine department has been taken over by the new Industrial Commission and goes out of existence as a separate department. Mr. Davies says that the business of 1913 should show a substantial gain over that for 1912 when it was 34,400,000 short tons. He also says one of the needs of the mining industry of Ohio is more thorough supervision and greater precaution on the part of the operator. He calls attention to the increased number of fatalities.

**Athens**—The commission appointed by Governor Cox to investigate the conditions surrounding the payment for coal mined in Ohio spent last week inspecting Mine No. 9 of the Circle Hill Coal Co., near Athens. Governor Cox accompanied the commission on its investigation trip. Next week mines in the Indiana and Illinois district will be investigated. It is the plan to bring the operators and miners together to agree on a number of witnesses from each state to testify before the commission. Every effort is being made to have the report ready by Dec. 1.

**Massillon**—Massillon city firemen recently fought flames in an entry of the Smith-Beaver mine 150 ft. below the surface of the earth until they had them under control. All of the fighters were equipped with smoke helmets.

#### INDIANA

**Princeton**—John G. Wright, deputy inspector of mines in Indiana, recently closed down the plant of the Princeton Coal Mining Co., for failure to obey certain orders with reference to the manner of operating. Inspector Wright said that the mines would not be allowed to reopen until his orders were complied with.

#### ILLINOIS

**Belleville**—In the Circuit Court here, the suit of Sherman Grant against the Chicago, Burlington & Quincy R.R. and the Southern Coal & Coke Co., for the loss of his right leg under a coal car while working for the coal company, resulted in a judgment of \$6000. He sued for \$10,000. While running down cars at the coal company's mine, in some manner he fell in front of a coal car, claiming the railroad company and the coal company at fault.

The annual report of the County Mine Inspector for the past year shows a death toll of 9 lives lost in the production of coal, a decrease of 4 from the previous year. Forty-one were injured, which is 12 less than last year. The report shows that one man out of every 630 miners was killed and one out of every 39 injured each year. The total number of employees in the mines in the county is 5717. The total production of coal was 4,738,198 tons, an increase of 217,672 tons in the 73 mines in the county, of which 8 did not operate during the year on account of the low price of coal. During the summer months 24 mines suspended on account of no business. Two new mines were opened during the year and four old mines abandoned, two on account of mine fires.

**Herrin**—Mine B of the Chicago & Carterville Coal Co. employing 350 men resumed operations Sept. 16. The indications are that the coming fall will be the greatest season ever experienced for the production of coal in this region.

**Bush**—It will likely be many months before work is resumed at the mine of the Western Coal & Mining Co., at this point. Progress in cleaning out the squeezes and falls is slow.

**Springfield**—Inability to meet a bond issue of \$2,500,000 will result in a public auction within the next 60 days of the mining properties of the Illinois Collieries Co., valued at \$3,000,000. The decree has been entered in the Sangamon Circuit Court. The sale will be made at the Court House in Springfield, of the eight different mines, located as follows: Springfield, mine known as the Dickerson Coal Co.; Chatham, abandoned mine; Auburn, a leased mine; Virden,

two mines; Girard, one mine; Litchfield, one mine; Sorento, one mine.

Several of these mines have been leased to other parties and are being operated, but the leases were subject to an action of the above nature.

**Chicago**—Three additional involuntary petitions in bankruptcy were filed Sept. 15 in the United States District Court against concerns affiliated with the O'Gara Coal Co. These companies were the Middle States Coal Co., the Imperial Mining Co. and the Vivian Collieries Co. Judge Carpenter appointed Thomas J. O'Gara and Fred A. Busse to act jointly as the receivers for the companies. He later issued injunctions forbidding the sale of various bonds and other property held as collateral against two of these companies.

#### MICHIGAN

**Bay City**—All coal mines in the Michigan district were closed Sept. 15 and the operators insist that they will not be re-opened until the differences between the union and the Handy Brothers Mining Co. in Bay County are adjusted. About 3000 men are affected by this suspension of work the cause of which is the alleged refusal of union officials to consent to an arbitration of differences. Seven hundred men recently struck at Handy Brothers Mine claiming that the operators had refused to pay what was due them under the working agreement made in April 1912.

#### COLORADO

**Trinidad**—A strike of most of the coal miners of District 15, United Mine Workers of America was declared Sept. 15 to take effect Sept. 23. The resolution of the Executive Committee of the United Mine Workers endorsing the strike was adopted by a unanimous vote at a convention of the district.

Several cars of provisions are being distributed among union commissaries, and union leaders have rented ground presumably for concentration camps. The operators are also making preparations to protect their property in case of serious trouble.

## PERSONALS

Isidor Wulfson, city weights and measures inspector for Indianapolis, has made a ruling that coal must be sold by small dealers by the standard weight or measure and not by the basket. If they sell by the bushel they must give 80 lb. to the bushel.

A. H. Von Bayer, of Detroit, Mich., has arrived at Ashland, Ky., to take up his duties as superintendent of the new plant of the Solvay Coal & Coke Co., at that place. H. M. Cole, superintendent of construction, who has been at work on the new plant, has left Ashland.

George E. Smith, auditor for the Utah Gas & Coke Co., Salt Lake City, has been appointed assistant auditor of the American Public Utilities Co., at Grand Rapids, Mich. The latter company is a parent organization of the Utah concern and controls 11 gas and electric street railway corporations in various cities.

A. W. Calloway was appointed vice-president of the Davis Coal & Coke Co., Sept. 18, by J. M. Fitzgerald, president of the coal company and of the Western Maryland Ry. Mr. Calloway is at present general manager of the Rochester & Pittsburgh Coal & Iron Co. with offices at Indiana, Penn. He will assume his new duties not later than Nov. 1.

Hywel Davies, of Louisville, Ky., the active head of the Kentucky Mine Owners' Association, recently moved his offices to Lexington, where he has business interests which demand his attention. That location is also more convenient as the headquarters of the Mine Owners' Association, on account of its proximity to the rapidly developing eastern Kentucky field, and by reason of the fact that the State Department of Mines is also located in that city.

Earl Henry, state mine inspector of West Virginia, has announced the appointment of two new inspectors. Enoch Carver, of Charleston has been appointed to succeed J. H. Jackson in the Sixth District. E. B. Lambert, of Williamson, succeeds H. H. Pinckney in the Twelfth District composed of Wayne, Mingo and part of McDowell counties. Mr. Lambert has lately been general manager of the Glen Alum Coal Co.

William Haven, manager of the Inland Fuel Co., of Charleston, Iowa, in announcing to the company's employees the firm's intention to cease operations, paid a high tribute to



Supt. George A. Verner, son of John Verner, and to Hoisting Engineer W. S. Lowe. He said in part: "During a period of more than 11 years not a man has been killed or even seriously injured, and there has been no friction over labor conditions and no call for arbitration." This excellent record he attributes to the care and diligence of the superintendent and hoisting engineer above named.

## OBITUARY

James Ross, ex-president of the Dominion Coal Co., died at Montreal, Sept. 20, from heart disease at the age of 65 years. Mr. Ross was born at Cromarty, Scotland, and came to the United States in 1870 where he became chief engineer of the Ulster & Delaware Ry., and held other important positions.

Removing to Canada he was appointed chief engineer and subsequently general manager of the Victoria Ry. He built the Credit Valley Ry. in 1878 and 1879 and in 1883 had charge of the construction of the Canadian Pacific Ry. west of Winnipeg.

He took up his residence in Montreal in 1888 and became identified with many extensive industrial and electrical enterprises occupying the position of president of the Dominion Coal Co. for many years. At the time of his death he was president of the Dominion Bridge Co. and the St. John Ry. and a director of numerous other companies.

Mr. Ross was a member of the American Society of Civil Engineers and a noted yachtsman, devoting much of his time to this sport. He was a liberal contributor to hospitals and other charitable institutions.

## CONSTRUCTION NEWS

**Connellsville, Penn.**—Work on the 200 new ovens at Leisenring, No. 2, is being pushed as rapidly as possible. One hundred new ovens are also to be added to the Clarissa plant.

**Pocahontas, Va.**—The Pocahontas Consolidated Collieries Co. expects to build a steel tippie near Bluefield, W. Va., at a cost of about \$65,000 with a capacity of 3000 tons in eight hours.

**Bellair, Ohio**—The Cambria Mining Co. which is developing coal near here has its shaft completed and has let a contract for the erection of a steel tippie 50 ft. high, and 200 ft. long.

**Boswell, W. Va.**—One of the biggest shaft mines in the state and one of the most complete and up to date in America, will be constructed for the Consolidation Coal Co. on the old Biesecker farm near Boswell.

**Birmingham, Ala.**—A plant to manufacture benzol is to be erected at the by-product coke ovens at Fairfield in the next few months by the Tennessee Coal, Iron & Railroad Co. It is estimated that this plant will cost \$1,500,000.

**Champaign, Ill.**—After considerable deliberation John O'Neill has decided to sink a shaft on his farm where a coal bed was discovered several weeks ago. The vein is 7 ft. thick which is somewhat thicker than the average in this part of the state.

**Fairmont, W. Va.**—It is estimated that the Louisville & Nashville, Chesapeake & Ohio and Baltimore & Ohio railways, have expended, or are about to expend over \$55,000,000 developing the Elkhorn coalfields in southeastern Kentucky. The coal is claimed to be of the highest grade for coking, its production and by-products.

**Norwood, W. Va.**—It is reported that work is well under way on a new branch line of the Norfolk & Western R.R., from Norwood, W. Va., up Laurel Hollow, a distance of four miles, in order to reach the properties of the Houston Coal & Coke Co., upon which shafts are already being sunk. The property is said to be unusually promising.

**Jenkins, Ky.**—Three hundred and fifty carpenters who have finished their work at Jenkins, the newest town of the Consolidation Coal Co., have gone to Fleming, the center of the Mineral Fuel Co.'s operations, to push forward the work of completing the buildings proposed for that town, before cold weather begins. The Nicola Building Co., of Pittsburgh, Penn., has the contract for most of the work being done, and is employing in the neighborhood of 2000 men in Fleming.

**Columbus, Ohio**—Coal operators, shippers and especially dealers in Columbus, are much interested in the plans for flood prevention, which are now the chief topic of discussion. Recently expert engineer Alvord submitted 10 different plans for preventing future floods in the Buckeye capital. He recommended plan No. 7, which provides for digging a new channel 880 ft. wide, and capable of taking care of 150,000 cu. ft. of water per second. The cost of this plan is \$12,000,000. The city council has taken steps to have the question of issuing \$8,500,000 bonds for the city's share of the cost, submitted to the voters at the November election.

## NEW INCORPORATIONS

**Oakland City, Ind.**—The J. M. C. Coal Co. has been incorporated to mine and deal in coal. The incorporators are John A. Jones, Janral R. Jones and K. Jones.

**Cleveland, Ohio**—The Balkan Mining Co., of Cleveland, Ohio, has filed papers with the secretary of state, increasing its capital stock from \$300,000 to \$500,000.

**Cleveland, Ohio**—The Kea Coal Co. has been organized in Cleveland to mine and deal in coal. The capitalization is \$10,000 and the incorporators are Quay H. Findley, A. E. Bowdler, F. B. Pease, M. F. Edwards and T. F. Burton.

**Columbus, Ohio**—The Hazel Ridge Coal Co. has been organized to mine and deal in coal. The capital stock is \$10,000 and the incorporators are Louis G. Addison, John R. King, Thomas H. Clark, L. L. Schaeffing and Arlington O. Harvey.

**Pomeroy, Ohio**—The Martin-Ersbach Co., of Pomeroy, Ohio, has been incorporated with a capital stock of \$250,000, to mine and deal in coal. The incorporators are H. C. Royal, R. F. Marburger, C. L. Leher, C. E. Herrman and F. A. Siebold.

**Williamsburg, Ky.**—The Southern Mining Co. was recently incorporated, with a capital stock of \$30,000, for the purpose of taking over the business of the Southern Mining Co. of Kentucky. The incorporators were E. C. Mahan, A. M. Stewart, P. G. McElroy and others.

## INDUSTRIAL NEWS

**Charleston, W. Va.**—During the month of August 1913, the Norfolk & Western Ry. transported the following tonnage of coal from the West Virginia mining district: Pocahontas Field 1,318,149 tons, Tug River Field, 232,865 tons, Thacker Field, 296,422 tons, Kenova Field 89,271 tons, total 1,936,707 tons.

**Washington, D. C.**—Freight rates on coal, both bituminous and anthracite, shipped over the Chicago, Milwaukee & St. Paul Ry. and other lines from upper lake ports to destinations in the Northwest, particularly in South Dakota, were attached Sept. 19 before the Interstate Commerce Commission by the State of South Dakota. It was alleged that existing rates were unreasonable, discriminatory and excessive, and the commission was asked to readjust them downward on a basis of equity.

**Fairmont, W. Va.**—A deal was completed Sept. 19 by which the Fairmont and Cleveland Coal Co. purchased the holdings of the Parker Run Coal Co., for a cash consideration of \$200,000. The new company is composed mainly of Fairmont and Cleveland men, and the capitalization is \$600,000. The company also owns several hundred acres of coal land so far undeveloped on Kiverbaugh Creek. The Parker Run Co.'s holdings were developed and shipment was being made by boat and rail for the past two years. The new company will continue the present method of shipping and will also ship over the Baltimore and Ohio R.R.

**Richmond, Va.**—People living along the Norfolk & Western R.R. are soon to have a hearing against that carrier before the State Corporation Commission. The handling of coal from Virginia mines is the basis of the complaint. These mines are along the line of the Virginia Southwestern, and in order to get to the parties along the line of the Norfolk & Western, it is necessary to use both roads. The tariff on coal would therefore be higher. The Norfolk & Western is understood to demand nearly as much for bringing the coal from Bristol to points along its line as it does for coal brought from Pocahontas. The case will probably come up in the course of the next few days.

## COAL TRADE REVIEWS

### GENERAL REVIEW

**Anthracite coal more active although lake shipments are slowing down. Abnormal tonnages of bituminous being diverted to the Eastern markets but prices continue firm. Operators finding it difficult to meet their obligations.**

If the winter weather opens up early, as conditions seem to indicate, there will be a quick rush for hard coal. There is already a notable change for the better in the retail trade, while reports from the mining regions are to the effect that the big producers are beginning to tune up production. There is an insistent and almost urgent demand for certain grades. Lake business is slowing up because of a congestion at the upper end, but ports on the Atlantic Coast, which are closed to navigation in November, are buying aggressively.

The inquiries for bituminous are plentiful and indications are that prices will shortly move to still higher levels. The lower grades, and shipments all-rail are inclined to be dormant with a slight disposition to sag but this appears to be only temporary. If the demand holds firm, a flurry of greater or less proportions seems to be inevitable this fall. The appearance of some inclement weather has interfered with the coastwise movement to such an extent that the accumulation at Boston has already been cleaned up.

The Eastern railroads are not permitting their equipment to be consigned to Western points, with the result that there has been more than the normal tonnage diverted into the Eastern markets. There is a steady call at tidewater for all good grades, and some operators are experiencing difficulty in meeting their contract obligations. Practically all of the West Virginia coals are commanding premiums, whether for prompt or deferred delivery.

The car supply has been less plentiful in the Pittsburgh district, particularly on certain divisions, and the production is being maintained with difficulty. Domestic coal is the feature of the situation there, dealers who failed to contract earlier in the season now being forced into the open market. It has been pointed out that the Pittsburgh district may develop a very competitive trade this season because of the large tonnage which the operators have left uncovered, for use in the prompt market.

The lake business in Ohio has slowed down materially, due to the large accumulation at the head of the lakes, and the short supply of vessels. In the other markets, however, all grades continue to show increased strength, particularly domestic coal, which is in excellent demand; a big rush is anticipated when the cold weather opens up. There is even less coal at Hampton Roads than last week, but large shipments are en route from the mines, so that the situation will be improved shortly. A vigorous buying movement was precipitated in the Southern market by the advent of some unexpected cool weather.

Shipments in the Middle West have slowed up somewhat, but are generally good on the whole. Buyers who failed to contract are now inclined to disregard the higher prices in their anxiety to get under cover; operators, on the other hand, prefer to hold off. The prospects for the fall business are excellent. Steam grades are a little difficult to move, although a great many mines are well sold up ahead.

### BOSTON, MASS.

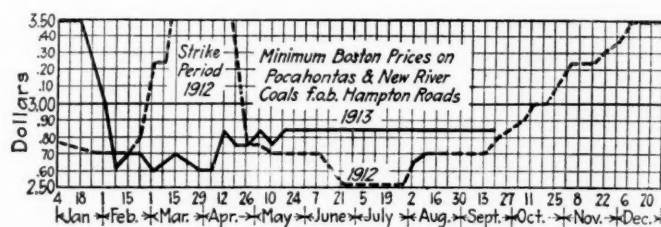
**There is an upward turn to Pocahontas and New River, and the demand is strong in every direction; orders being declined. Georges Creek receipts at tide very small. The Pennsylvania coals share the general firmness, and higher prices are looked for. The beginnings of a rush for anthracite.**

**Bituminous**—Things are beginning to happen in the Southern coals. Practically every brand of Pocahontas and New River is now commanding a premium for shipment either spot or deferred, and some of the agencies are so far sold up in one direction or another that they are now declining business of any kind. The off-shore demand is notably strong, due largely to apprehensions abroad, and there are rumors, too, of labor agitation in the lower districts of West Virginia. Loading dispatch at Hampton Roads is still normal but only because shippers are rejecting tonnage except on old purchases. If the demand holds to the strength it is now assuming we shall have an active market in October; \$3 f.o.b. Norfolk has been reached this week and no let-up is now in

near prospect. All factors are growing shy of committing themselves and it may be we shall have an autumn "flurry."

The weather has been unfavorable to movement coastwise and the handling piers here are gradually working through the accumulation of the past fortnight. The situation in New England is therefore in comfortable shape.

Georges Creek receipts at tide continue very light, and it begins to look dubious for any heavy volume of this popular grade. The shippers are apparently confining their efforts to the clearance of large bottoms at Baltimore, to such extent, in fact, that Philadelphia and New York requisitions go begging.



The Pennsylvania coals are also showing renewed strength. Inquiries are plentiful and it is probably only a matter of days when prices will begin again to move to new levels. Contracts made last spring that have since remained dormant are now being revived and there is a steady call at tide water for all the good grades. All-rail the demand is moderate but with a strong outlook for the rest of the season.

**Anthracite**—All the companies are well supplied with orders. Broken and stove are getting increasingly short. From New York some of the shippers are declining orders that call for more than a third stove in the cargo. If the winter starts cold there will almost surely be a rush for hard coal of any kind. The Eastern ports that will close to navigation late in November are getting vitally interested in having cargoes come forward, and in every quarter the demand is active. The new advance in barge rates from New York will tend to throw an extra pressure on Philadelphia and developments are already being watched with more or less concern.

Quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	\$1.10@1.50	\$1.30@1.65	\$1.67@1.77	
Philadelphia*	2.35@2.75	2.55@2.90	2.92@3.02	
New York*	2.65@3.00	2.85@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.90@3.00
Providence†				3.83@3.93
Boston†				2.98@4.08

### NEW YORK

**Soft coal tending to ease up slightly, but this is confined to the off grades. Supplies at tide rather low. Retail anthracite active and the wholesale trade is also beginning to feel the effects of the advancing season.**

**Bituminous**—There appears to be a feeling in some quarters that the soft-coal market is a trifle easier this week. However, the good grades continue in as short supply as ever, what weakness there is being confined entirely to the off qualities or certain specialties, for which there does not happen to be any demand at the moment. The high-volatile railroad coals are particularly easy. On the other hand supplies at tidewater are generally low, so much so in some instances, as to cause some uneasiness. As a matter of fact it is noticeable that pessimistic opinions of the situation emanate principally from buyers.

The car supply is beginning to tighten up quite perceptibly, particularly on the Pennsylvania, where operations are often quite restricted at the close of the week; the situation is somewhat better on the New York Central. The heavy rains last week relieved the water famine, which was causing some restriction in operations in the Pennsylvania field. Quite a lot of labor trouble is cropping up in spots, which is making it difficult to maintain a heavy production; there are



indications that the "button strikes," which have been so prevalent in the hard-coal region, may be spreading to the bituminous districts also.

It will be entirely a weather market from now on. The fall in temperature must inevitably bring higher prices, whereas if the weather continues mild quotations will remain steady. At present the market has not experienced any change and remains quotable on the following basis:

West Virginia steam, \$2.60@2.65; fair grades of Pennsylvania, \$2.70@2.75; good grades of Pennsylvania, \$2.80@2.85; best Miller Pennsylvania, \$3.10@3.20; George's Creek, \$3.15@3.25.

**Anthracite**—The retail hard-coal trade is opening up actively, orders coming in from all directions. The improvement has not extended to the wholesale branch as yet, however, and this continues to drag, particularly as regards certain sizes. Stove coal is in short supply with orders far in excess of the demand; nut is improving, the demand now appearing to be about up to the production. The steam grades continue going into storage and are in quite easy supply, particularly pea and buckwheat; the advent of colder weather will cause these to move more promptly.

The somewhat cooler weather already experienced is, no doubt, having a psychological effect upon the consumers, who are giving more consideration to their fuel supplies than would otherwise be the case. It is also noticeable that there is a tendency to tune up the production in the mining regions. The car supply is generally excellent, except when certain equipment is specified, as, for instance, box cars. The heavy rains last week removed the possibility of a water famine, which has been threatening for some time.

We quote the New York market as follows, with prices moderately firm except on a few grades:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$5.00		\$4.95	
Egg.....	5.25	\$5.15@5.25	5.20	\$5.10@5.20
Stove.....	5.25	5.25	5.20	5.20
Chestnut.....	5.50	5.40@5.50	5.45	5.30@5.45
Pea.....	3.50	3.40@3.50	3.45	3.35@3.45
Buckwheat.....	2.75	2.60@2.75	2.45@2.70	2.35@2.70
Rice.....	2.25	2.25	1.95@2.20	1.80@2.20
Barley.....	1.75	1.75	1.70	1.50@1.70

#### BALTIMORE, MD.

The market for the cheaper grades of soft coal showing considerable weakness. Demand East and South very light. Slack still continues best feature of market. Car supply much better.

While the better grades of coal, which are now pretty well covered by contract, are showing no signs of weakness, the market for the lower-class fuels was sagging during the week. The Great Lakes were still calling for large quantities of three-quarter coal from West Virginia, but a number of Eastern roads are refusing to allow their equipment to move westward and many operating interests were forced to ship coals east that they could have obtained much better prices for in the West. The result was that the supply was considerably in excess of the Eastern demand for spot fuel and sales were made of fair grade West Virginia coals around 85 and 95c. Westward these same grades were bringing about 15c. to 20c. better.

The lower grade Pennsylvania coals were not in anything like as liberal supply, and while demand was not very brisk, prices continued firm at \$1 to \$1.10. The better grades were not much in the market, and the few spot sales recorded were around \$1.50. Gas slack proved the real sensation of the week; instead of moving backward it continued to advance. Demand on every side was reported in excess of the supply, and the result was that sales around \$1 were recorded.

Car supply was much better. Under the lightened demand for quick movement the West Virginia field, which was so short of cars the week before, reported plenty of equipment for movement East. The only shortage seemed to be in connection with the heavy movement toward the lakes. Lack of labor still continues a serious problem in many mining districts.

The announcement of the appointment of A. W. Calloway, of the Rochester & Pittsburgh Coal & Iron Co., as vice-president and general manager of the Davis Coal & Coke Co., is looked on here as the first step on the part of the Western Maryland Railroad to bring about a separation of its railroad and coal interests.

#### PITTSBURGH, PENN.

Production at full rate, with cars scarcer. Increased demand for domestic coal. Unsold capacity for delivery after lake shipments close. Connellsville coke prices maintained with more difficulty. The production of furnace increased while the merchant ovens decreased.

**Bituminous**—Market demand for domestic coal has materially increased. Many dealers failed to make their usual contracts last spring, with the result that there is more buying than usual at this time. Shipments are heavier on such contracts as were made. Car supply is not so good as it was, there being serious shortages now reported on some divisions. Labor supply is about the same as formerly. Production is approximately as heavy as at any time, but is maintained with more difficulty. There is not much demand for free coal outside of that for retailers. Prices are well maintained as lake shipments continue heavy, but it is understood that a number of operators curtailed their contracts in the hope of securing better prices late in the year and this may develop more active competition, putting prices to a test, which has been lacking in the past few months.

Regular prices are well maintained: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1¼-in. steam, \$1.50; 1¼-in. domestic, \$1.55 per ton at mine, Pittsburgh district.

**Connellsville Coke**—The market for prompt furnace coke has been somewhat irregular, there being moderate offerings, with very light demand. Prompt coke of slightly off grade has probably gone as low as \$2.25, and standard grade at \$2.40, but only in very limited tonnages, regular supplies being held at \$2.50. No important demand is to be expected until furnaces covered for September, but not October, come into the market, when the \$2.50 price maintained for several months may be under greater pressure than at any previous time. We quote: Prompt furnace, \$2.50; contract furnace, \$2.50; prompt foundry, \$2.90@3; contract furnace, \$2.90@3 per ton, at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ending Sept. 13, at 374,810 tons, an increase of 5351 tons, the furnace-oven output having increased 14,097 tons, and the merchant-oven output decreased 8746 tons. Shipments are reported at 374,911 tons, an increase of 3641 tons.

#### BUFFALO, N. Y.

No slackening off in demand for bituminous. Slack continues firmer than sizes, which is a very good sign. Reports from Pittsburgh state that the trade is very confident. Anthracite beginning to move. Fall demand is here.

**Bituminous**—The trade is quiet and firm as ever. Nobody has any surplus and it is difficult to keep up a supply, especially for filling contracts. Operators would be glad if they had no contracts, hard as it is to refuse one when offered at current prices. A local jobber reports an offer of a large contract for slack, but he is not able to decide on a price; it is the very strong condition of the slack market that creates most of the confidence.

It is said by some of the jobbers that the demand for any sort of coal is not heavy, but the operators state that they could sell much more than they are able to mine. This is not a jobbers' market in any sense, so that all reports from them must differ quite widely from the views of operators. This is, in fact, about the first time in the history of bituminous coal when it would sell itself. Cars are steadily becoming scarcer and they will not be at all plenty again for some time. There has been much difficulty all through the Allegheny Valley to obtain water sufficient for either mining or locomotive supply. There has been considerable rain there, however, during the past week, so that the situation is now quite easy.

There is no change in the bituminous quotations, unless it is possible to make them still firmer than formerly. The figures continue at \$2.90 for Pittsburgh lump, \$2.80 for three-quarter, \$2.65 for mine-run and \$2.25 for slack, with Allegheny Valley about 20c. lower.

**Coke**—It seems impossible to stiffen up the coke market, after the manner of bituminous coal, though it is so much lower than it used to be. The combined efforts of consumers to break down the price appears to be still exerted. Jobbers are at a loss to find any other reason for the weakness of prices, which are based on \$4.85 for best Connellsville foundry, with some jobbers quoting 10c. lower.

**Anthracite**—The recent cool weather revived the anthracite market decidedly, and some shippers are reporting quite an insistent demand for stove, which is running away ahead of chestnut; indications are that it will be hard for the companies to hold the advance of 25c. over the price of chestnut, made sometime ago. The consumer as a rule now finds that he can use stove, not only in place of chestnut, but in furnaces also, and this is not favorable to the higher price.

The Western trade in anthracite is picking up fast on all rail lines, and it would also be active by lake if the upper

docks could handle it. As they are badly congested, the amount shipped here in that trade has been reduced. Shipments by lake for the week were only 91,000 tons, which is about the first time for the season that the amount has fallen below 100,000 tons. It practically all goes to the head of Lake Superior, Chicago and Milwaukee. Shippers look for a revival of this trade with the more liberal buying from the districts west of Lake Michigan, which is now setting in.

#### TOLEDO, OHIO

**Some slowing up in the Lake movement because of the short supply of vessels and signs of a congestion at the upper ports. Traffic situation moderately good. General demand about normal.**

The Lake loading continues fairly active at the Toledo docks although there are not quite so many boats as were loaded earlier in the season. This is due to the fact that there is not enough ore to load the boats and many are being utilized for wheat shipments instead. An unusual quantity of coal has also accumulated at the uplake docks which has caused a slight slackening of the demand.

The traffic situation is not yet at all serious. An embargo was placed on Hocking Valley shipments by the C. & O. during the past week but it is believed this is only temporary. There continues some difficulties with Northern shipments out of Toledo but not enough to cause alarm or serious inconvenience. The general demand is normal for this season of the year. Domestic coal is not especially brisk but a few cold days would work wonders with this end of the market. Steam coal is in good demand. Prices here are as follows:

	Poca- hontas	Hock- ing	Jack- son	Pome- roy	Mass- ilon	Pitts. No. 8	Cam- bridge
Domestic lump.....	\$2.50	\$1.75	\$2.50	\$2.00	\$2.50	\$1.35	\$1.35
Egg.....	2.25	1.20	2.50	1.75	2.50	.....	.....
Nut.....	1.80	1.20	2.25	1.75	2.50	.....	.....
1/2 lump.....	.....	1.35	.....	.....	.....	1.20	1.20
Mine-run.....	1.60	1.35	.....	.....	.....	1.10	1.15
Slack.....	.....	0.70	.....	.....	.....	0.80	.....

#### COLUMBUS, OHIO

**Continued strength is the chief feature in the local trade. The demand for all grades is good and prices inclined to advance. Shortage of cars has been growing worse and production is curtailed to a certain degree. Lake trade active and domestic demand is strong.**

The coal trade in Ohio has been active during the week and the only change is an increased strength all along the line. All grades are in demand and no weakness of any sort has been reported. The car shortage is growing worse and this has curtailed production to a certain degree. Operators, shippers and dealers say the market is in good condition and an active winter season is freely predicted.

The domestic demand is the feature of the trade. Dealers in all sections have been placing orders and asking for prompt shipment if possible. Because of the lack of cars, stocks in the hands of the dealers are not being replenished. The smaller users are placing their orders now and retailers are busy with deliveries. Steam business is also active, especially in the northern part of the state. Manufacturers are running along steadily and their requirements for fuel are about the same. Railroads are consuming a considerable tonnage trying to keep up with the freight movement. Contracts are being renewed at higher figures than last season. Many of the steam users are buying their supply in the open market.

Production has been at the mercy of the car supply almost entirely. Eastern Ohio operators have been the greatest sufferers from a lack of cars and it is believed the output was only about 60 per cent. of normal in that district. In the Pomeroy Bend field the production was about 65 per cent. and the same figures prevail in other sections, excepting the Hocking Valley which reported the best car supply; the output there is estimated at 75 per cent. of the average.

Lake trade is strong and the tonnage moving to the Northwest is still large. Up to date the Toledo docks of the Hocking Valley Railroad have handled 2,095,000 tons since the opening of navigation. Docks at the upper lake ports have been kept free from congestion as the interior movement is good. Lake prices are strong in every way.

Small sizes are in good demand and prices for both nut, pea and slack and coarse slack are stronger.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump.....	\$1.75 @ 1.70	.....	\$1.85 @ 1.75	\$1.70 @ 1.65
3-4 inch.....	1.60 @ 1.55	\$1.30 @ 1.25	1.55 @ 1.60	1.55 @ 1.50
Nut.....	1.30 @ 1.20	.....	1.40 @ 1.25	1.25 @ 1.20
Mine-run.....	1.40 @ 1.25	1.20 @ 1.15	1.30 @ 1.25	1.25 @ 1.20
Nut, pea and slack..	0.70 @ 0.65	.....	0.75 @ 0.70	0.70 @ 0.65
Coarse slack.....	0.60 @ 0.55	0.85 @ 0.75	0.65 @ 0.60	0.60 @ 0.55

#### HAMPTON ROADS

**Movement from Hampton Roads heavy. Shortage of coal still continues but situation may be relieved in few days.**

The coal movement from Hampton Roads piers for the week has been heavy and while all of the suppliers have been short, the end of the week finds very little tonnage held up waiting for cargoes. The railroad yards are about cleaned out and while the amount on hand at the end of last week was considered small the number of cars here now is considerably less. However, during the last few days some large shipments have been started from the mines and with this coal coming forward the situation should be much improved. Owing to the heavy demand on contracts there has been little spot coal and such sales as have been made were only for small quantities and at prices which the suppliers have preferred to keep to themselves.

Shipments in the foreign trade have been fairly good. The steamship "Finchley" recently took 1550 tons for Danzig; this shipment from what can be ascertained, is a sample lot sold with a view of introducing West Virginia coal to the manufacturers at that port.

#### LOUISVILLE, KY.

**Screenings heavy due to the large demand for domestic grades. Car supply good except for certain classes of equipment. Some further contracts closed.**

The colder weather of last week has disappeared, but has been followed by a raw, damp chilliness that has not been without its effect upon the consumers, and the demand for domestic grades is excellent. With cars in moderately good supply, dealers are having no difficulty in meeting the demand, and there is a heavy movement; prices are strong and show a perceptible rising tendency.

This large call for the domestic coals has naturally resulted in a heavy production of screenings and there seems to be a surplus of these developing; while this has been the case with the western Kentucky product for some time, it only appeared in the eastern Kentucky field during the last week. The surplus of screening now available would be more than sufficient to cover the demand in an active market, so that with requirements light as at present, prices are not very strong. The trouble is ascribed to the conservative attitude of the larger business interests and some uncertainty regarding the crop situation.

The Louisville & Nashville R.R. "battleship" cars are still causing a great deal of trouble, particularly in the eastern Kentucky field, where the operators are being compelled to load most of their production in this type of equipment. A large tonnage of the better grade domestic coal was negotiated for Northern delivery at \$2 f.o.b. mine for 2 1/2-in. block and lump. Block is now quotable at \$2.10 @ 2.25, while block and lump is scarce and in good demand at \$1.90 @ 2. The better grade screenings are rather heavy at 75c. with the off qualities almost impossible to move at any price; western Kentucky nut and slack is plentiful at 50c. and pea and slack difficult to sell at 25c. A few more consumers who have delayed contracting in anticipation of lower prices, have recently signed up at advances of from 10 to 15c. higher than last year.

#### NEW ORLEANS

**Unseasonable coolness starts retail rush earlier than usual. Talk of making this point a big base for export shipments. Bunker trade heavy. Interior demand vigorous. Honduras principal export buyer.**

With the coming of a cold snap that made fires comfortable in northern Louisiana last week, retail trade picked up vigorously. This has started the buying season several weeks ahead of the average time and will do much to relieve the congestion of orders that comes usually in October.

Extension of an option held on a tract of river front land has revived the talk of making this port the base for an extensive export trade in coal. While the local agencies of the companies bringing coal here by river are reticent there is reason to believe that plans to this effect have not taken definite form.

Shipments to interior points in Louisiana and eastern Texas continue to move in considerable volume. Bunker trade is heavy. Ceiba and Tela, Honduras, are the best export customers at present; this is due to the activity of the United Fruit Co. at these points, where extensive railroad and constructional work is in progress.

#### BIRMINGHAM, ALA.

**Market on coal fair. Furnace and foundry coke strong. Slight improvement in car supply. Pig iron firm at \$11.50 for last quarter and \$12 for first quarter 1914.**

The demand for steam coal is only fair, with prospects of an early improvement. The cool weather of the past few



days, while not materially helping the lump market, as far as orders are concerned, has brought out a number of inquiries from the late buyers, and the next few days will see a decided change for the better in this line. Blacksmith coal has been quiet for the past sixty days, but shows a decided improvement over last week. There is little furnace coke offered in this district, on account of local consumption, but one producer sold 5000 tons to a Western smelter at a very satisfactory price. Inquiries amounting to about 15,000 tons of coke for shipment over the next 60 days are on hand, and the business will probably be placed this coming week. Foundry coke is firm at \$3.75 and \$4, with fairly good business.

Pig iron is firm at \$11.50 for the last quarter of this year, and the producers are holding for \$12 for the first quarter of next year, several sales having been made on that basis. Very little iron has been booked for the first quarter, and large sales are predicted within the next 30 days.

#### INDIANAPOLIS

**Shipments becoming slower but fairly good on the whole. Retail prices advanced. Eastern coals in good demand.**

Conditions continue to improve steadily but slowly in both the operating and selling ends. Railroads are moving the coal with fair dispatch and there should be good supplies accumulated before the crops put a heavy burden on rail transportation. The movement is not satisfactory, however, in regard to Eastern coals; where shipments were formerly made within a week or ten days, it now takes three to four weeks. Some anticipate higher prices, as a result of a car shortage.

Owing to the fact that Indiana coal cannot be stored, except outdoors, it is only now beginning to move, into consumers' bins. There is a very brisk movement of Eastern coal from retailers' yards, some of the larger companies stating that they are practically running full capacity. The month's deliveries will apparently be much above the average. Screenings are not active, though better than some time ago. Mine prices in Indiana are unchanged.

The largest retailer in the city advanced prices 25c. to 50c. a ton on Sept. 22. His lead in the past has been generally followed, but other large retailers say they see no reason for an increase at present.

The new quotations given out (which include the advance) are:

Anthracite, chestnut.....	\$8.50	Hocking Valley lump.....	\$4.75
Anthracite, stove and egg.....	8.25	Luhrig lump.....	4.50
Anthracite, grate.....	8.00	Luhrig washed egg.....	5.00
Pocahontas, forked lump.....	6.50	Cannel.....	6.50
Pocahontas, shoveled lump.....	6.00	Linton No. 4 lump.....	3.50
Pocahontas, mine run.....	5.00	Linton No. 4 egg.....	3.50
Pocahontas, nut and slack.....	3.50	Indiana washed egg.....	3.75
Blossburg.....	5.50	Brazil block.....	4.25
Jackson (Ohio).....	5.25	Indianapolis lump coke.....	6.50
Kanawha lump.....	4.75	Indianapolis crushed coke.....	6.50
Kanawha egg, nut.....	4.75	Connellsville lump.....	7.00
Pittsburg lump.....	4.75	Citizens' egg coke.....	6.50
Raymond lump.....	4.75	Citizens' nut coke.....	6.50
Winifred lump.....	4.75		

#### DETROIT, MICH.

**Higher prices and an active fall trade predicted. Pocahontas grades very scarce. Car shortage becoming more acute.**

**Bituminous**—Both Ohio and West Virginia operators are agreed as to the prospects for an active business this fall. One large West Virginia producer recently advised his local representative here that no further contracts must be closed unless an advance of 10c. per ton could be obtained; this makes the price \$1.05, so that it will be seen that the prophecies for a stiff market in October are being justified.

Buyers are showing a tendency to disregard high prices in their anxiety to get under cover, while operators, on the other hand, are inclined to hold off. Spot coal is rather scarce, nut and slack bringing 90 to 95c. per ton, while Hocking is quoted at 75 cents. The car shortage is becoming steadily worse, particularly in West Virginia where flats and gondolas are in very short supply. Domestic coal is easing up some, all dealers appearing to be well supplied, although it is noticeable that there is very little standing on tracks.

Pocahontas, egg and lump are in particularly short supply and the price has been advanced to \$2.75, while it is freely predicted that \$3 will be obtained by Oct. 1. The local market is now quotable on the following basis:

	W. Va. Splint	Gas	Hock- ing	Cam- bridge	No. 8 Ohio	Poca- hontas	Jackson Hill
Domestic lump.....	\$1.65	....	\$1.50	....	....	\$2.75	\$2.50
Egg.....	1.65	....	1.50	....	....	2.75	2.20
Steam lump.....	1.50	....	....	....	....	....	....
3-in. lump.....	1.25	\$1.25	1.25	\$1.25	\$1.25	....	....
Mine-run.....	1.10	1.10	1.10	1.10	1.10	1.65	....
Slack.....	1.00	1.05	0.75	0.85	0.85	....	....

**Anthracite**—The cool spell has created some activity in hard coal, but prices are inclined to drag, the advance scheduled for the middle of the current month having failed to materialize.

**Coke**—Connellsville coke is in rather short supply at this point. There are rumors here to the effect that production is being restricted in order to advance the price which has been rather low for some time.

#### ST. LOUIS, MO.

**Market continues to show improvement and the outlook is excellent. Many of the mines are well sold up ahead. Steam grades difficult to move.**

The market is forging ahead slowly but steadily, and conditions in general are considerably better with prospects for an exceptionally good business beginning the last week in the month. Many of the Franklin and Williamson County operators have orders for one or two weeks ahead and are quoting higher prices than they expect, in order to get caught up. Standard operators, however, are still dragging along at the cost of production, and the same applies to many others in the intermediate fields.

The greatest trouble right now is the inability to move screenings and steam sizes, and this will likely continue until about the first of the year. There is more anthracite coming in than there is call for just now, but smokeless is away behind and is hard to get. There is an over-supply, at the present time, of coke and the prices have been cut to far below circular.

The market is now quotable on the following basis, f.o.b. mines:

	Cartersville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump.....	....	....	....	\$1.15
3-in. lump.....	....	....	....	1.50
6-in. lump.....	\$1.60 @ 1.85	....	1.60	1.35
Lump and egg.....	1.50 @ 1.60	\$2.15	....	....
No. 1 nut.....	1.30 @ 1.60	....	....	....
Screenings.....	0.50 @ 0.60	....	....	0.25
Mine-run.....	1.50	....	....	0.90
No. 1 washed nut.....	1.60 @ 1.70	....	....	....
No. 2 washed nut.....	1.20 @ 1.40	....	....	....
No. 3 washed nut.....	1.10 @ 1.15	....	....	....
No. 4 washed nut.....	1.00 @ 1.10	....	....	....
No. 5 washed nut.....	0.40 @ 0.45	....	....	....

**Note**—The Williamson and Franklin County Coals take a 67c. rate to St. Louis, Big Muddy 64½c., and all others 52c.

#### OGDEN, UTAH

**Cooler weather prevailing throughout intermountain territory. Demand for lump coal increasing, causing a surplus of nut and slack. Strike of coal miners in Colorado stimulated demand for Wyoming coal in Nebraska. Utah mines suffering from severe car shortage.**

The past week presented several conditions that stimulated the demand for coal, the principal one being cooler weather throughout the territory. Threshing has begun in several localities and the demand for coal in this trade has been brisk. The mines are receiving plenty of lump orders, sufficient to keep them running full time. As most of these have been placed late, the trade in general is demanding immediate shipment, and the operators are having some trouble to comply with all requests.

The increased demand for lump has increased the surplus of nut and slack coal, and at present quite a tonnage is drawing demurrage at the mines; however present indications are that the nut coal will all move before Oct. 1. The cool weather of the past ten days will delay beet harvesting and the sugar factories will not start their campaign until about Oct. 1. This will delay slack and steam coal shipments until Sept. 25, at which time the surplus of slack should be moved.

Negotiations between the Colorado operators and miners do not appear to be progressing satisfactorily and a suspension of mining operations in Colorado seems inevitable. This condition has caused large buyers in Nebraska to commence looking elsewhere for coal and the Wyoming mines are attractive prospects. In case of a strike, Rock Springs coal will be in demand to the East.

While the Wyoming producers are receiving plenty of cars, with an occasional shortage of box cars, the Utah mines are unable to work more than three days each week on account of the inability of the Denver & Rio Grande to supply equipment. The situation is very serious with no indication of relief. This is a good example of the rapid development of Utah; a plain case where the industries tributary to a railroad have advanced and developed faster than the road.

The increased demand for coal has not effected the price and quotations are as follows: Lump, \$2.75; egg nut, \$2.50; nut, \$2.25; mine run, \$1.85; slack, \$1.

## PORTLAND, ORE.

Owing to high freight rates there is practically no Australian coal in this market, and none likely to arrive now. Anthracite high priced and in little demand. Beaver Hill mine at Coos Bay again producing.

Australian coal has practically disappeared from the local market, owing to the fact that freight rates across the Pacific are too high to warrant importations. Not a cargo has arrived here since last spring and there are no vessels en route or loading at the Australian coal-shipping points for this port. Several cargoes are being shipped to San Francisco, however. All the Australian coal here in dealers' hands amounts to only about 1000 tons, and most of this has been contracted for.

## PRODUCTION AND TRANSPORTATION STATISTICS

## CHESAPEAKE &amp; OHIO RY.

The following is a statement of the coal and coke tonnage over the road during July of the current year, in short tons:

	Coal				Coke			
	Tons		Per cent.		Tons		Per Cent.	
	1913	1912	1913	1912	1913	1912	1913	1912
Tidewater.....	238,638	288,693	17	21				
East.....	191,791	164,748	14	12	8,476	11,566	28	58
West.....	866,872	931,885	62	66	11,870	6,528	40	33
Total.....	1,297,301	1,385,326			20,346	18,094		
From Connections								
Bituminous.....	93,402	15,541	7	1				
Anthracite.....	1,571	789	0	0				
Coke.....					9,599	1,882	32	9
Grand Totals.	1,392,274	1,401,656	100	100	29,945	19,976	100	100

## COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during June and the first six months of this year in comparison to last year, in short tons:

Anthracite	June		Six Months	
	1912	1913	1912	1913
Baltimore & Ohio <sup>1</sup> .....	102,270	93,211	703,422	758,699
Chesapeake & Ohio <sup>2</sup> .....	1,673	1,794	16,479	8,775
Erie <sup>3</sup> .....	700,534	741,319	3,293,054	4,205,048
Pennsylvania <sup>1</sup> .....	883,326	776,237	4,572,269	5,418,231
Virginian <sup>2</sup> .....		223	20	709
Total 5 roads.....	1,687,803	1,612,784	8,585,244	10,391,462
Bituminous				
Baltimore & Ohio <sup>1</sup> .....	2,732,735	3,212,728	16,748,062	17,555,910
Buffalo, Roch. & P. <sup>1</sup> .....	631,613	794,687	3,952,453	4,561,113
Buffalo & Susq. <sup>1</sup> .....	118,660	149,139	717,029	903,535
Chesapeake & Ohio <sup>2</sup> .....	1,550,418	1,605,063	8,916,951	7,980,768
Erie <sup>4</sup> .....	15,837	11,034	158,246	274,252
Hunt. & Br'd T. Mt. <sup>1</sup> .....	64,230	211,271	639,195	785,938
New York Central.....	492,388	677,267	3,926,504	4,468,852
Norfolk & Western <sup>1</sup> .....	1,989,305	2,061,911	11,066,363	11,431,452
Pennsylvania <sup>1</sup> .....	3,562,845	4,189,969	22,519,781	24,282,419
Pitts. & Lake Erie <sup>1</sup> .....	1,083,281	1,078,121	5,026,778	6,301,713
Pitts. Shaw. & North. <sup>1</sup> .....	133,719	201,798	933,883	1,324,848
Virginian <sup>1</sup> .....	256,070	304,030	1,752,278	2,201,033
Western Maryland.....	222,232	247,354	1,469,137	1,501,966
Total 13 roads.....	12,853,333	14,744,372	77,826,660	83,573,799
Coke				
Baltimore & Ohio <sup>1</sup> .....	424,009	386,920	2,334,295	2,108,330
Buffalo, Roch. & P. <sup>1</sup> .....	50,088	41,771	233,489	296,925
Buffalo & Susq. <sup>1</sup> .....	24,549	25,151	121,746	155,422
Chesapeake & Ohio <sup>1</sup> .....	20,811	30,015	125,911	180,538
New York Central.....	3,980	6,242	40,760	35,627
Norfolk & Western <sup>1</sup> .....	100,597	123,941	742,212	840,642
Pitts. & Lake Erie <sup>1</sup> .....	498,824	555,207	3,034,543	3,625,350
Pennsylvania <sup>1</sup> .....	1,033,381	1,161,521	6,374,293	7,386,908
Pitts. Shaw. & North. <sup>1</sup> .....			5,155	9,383
Western Maryland.....	4,778	4,582	34,975	40,093
Total 10 roads.....	2,161,017	2,335,350	13,047,379	14,679,218

## Coal and Coke, 13 Roads

January.....	16,421,839	18,936,646
February.....	17,787,331	17,546,496
March.....	19,483,025	17,631,345
April.....	13,429,367	16,850,690
May.....	15,635,568	18,986,796
June.....	16,702,153	18,692,506
July.....	16,635,448	
August.....	18,396,247	
September.....	17,432,358	
October.....	18,712,657	
November.....	17,815,767	
December.....	17,929,632	
Total, 12 months.....	206,381,392	

<sup>1</sup> Includes coal from connecting lines.

<sup>2</sup> Includes company's coal.

<sup>3</sup> Does not include company's coal hauled free.

Note.—Southern Railway handled 329,730 short tons during May and 1,733,636 short tons during the 5 months ended May.

## FOREIGN MARKETS

## GREAT BRITAIN

Sept. 12—For anything approaching early shipment nearly all classes of large and small coals are in plentiful supply, and values rule on the easy side; but for forward, sellers are steadily holding to their ideas.

Quotations are approximately as follows:

Best Welsh steam.....	\$4.80@4.92	Best Monmouthshires..	\$4.62@4.14
Best seconds.....	4.50@4.68	Seconds.....	3.90@3.96
Gas.....	1.044,002	Best Cardiff smalls.....	2.40@2.52
Seconds.....	4.26@4.44	Seconds.....	2.28@2.40
Best dry coals.....	4.32@4.56		

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

British Exports—The following is a comparative statement of British exports for August and the first eight months of the last three years, in long tons:

	August		8 Months	
	1912	1913	1911	1913
Anthracite.....	255,260	231,590	1,544,885	1,533,475
Steam.....	4,688,550	4,197,809	30,445,732	28,370,605
Gas.....	1,044,002	962,574	6,825,566	6,791,847
Household.....	189,430	137,375	974,102	991,688
Other sorts.....	280,443	289,814	2,040,755	1,985,249
Total.....	6,457,675	5,819,162	41,831,040	39,672,864
Coke.....	108,948	113,423	617,294	583,034
Manufactured fuel	163,030	140,278	1,117,783	990,258
Grand total....	6,729,653	6,072,863	43,566,117	41,246,156
Bunker coal.....	1,850,346	1,749,847		11,608,744
				13,720,560

## BRITISH INDIA

The output of coal in British India during 1912 shows a total production last year of 14,044,368 tons, which is nearly 2,000,000 tons in excess of the production recorded in the previous output, namely, 12,048,726 in 1911 and 12,149,020 tons in 1908. The actual output by provinces during 1912 was, in tons, as follows: Bengal, 4,306,129; Bihar and Orissa, 9,123,437; Punjab, 38,409; Assam, 296,615; Baluchistan 45,732; Central Provinces, 233,996; Northwestern Provinces, 50.

## CHINA

Vice Consul G. F. Bickford notes increasing coal exports from the Manchurian port of Newchwang. Shipments in July reached 49,648 tons, and bunker coals 5650 tons. The increase is mostly to the Japanese Government steel works at Wakamatsu, which took 15,875 tons, while 15,500 tons went to Shanghai.

## COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Sept. 20:

Stocks	Week's Range			Year's Range		
	High	Low	Last	High	Low	
American Coal Products.....	85½	85½	85½	87	80	
American Coal Products Pref.....				105½	105	
Colorado Fuel & Iron.....	34½	32½	33	41½	24½	
Colorado Fuel & Iron Pref.....				155	150	
Consolidation Coal of Maryland.....	102½	102½	102½	102½	102½	
Lehigh Valley Coal Sales.....	210	200	210			
Island Creek Coal Com.....	55	53	55	53½	47½	
Island Creek Coal Pref.....	86	84	86	85	80	
Pittsburgh Coal.....	21½	20	21	24½	14½	
Pittsburgh Coal Pref.....	88½	86	88	95	73	
Pond Creek.....	22	21	22	23½	16½	
Reading.....	170½	168½	168½	170½	151½	
Reading 1st Pref.....	84	84	84	92½	84	
Reading 2nd Pref.....	92	90	91½	95	84	
Virginia Iron, Coal & Coke.....	45	44	45	54	37½	
Bonds						
Colo. F. & I. gen. s.f.g. 5s.....	93½	98	95½	93½	99½	
Colo. F. & I. gen. 6s.....	103	106	107½	June '12		
Col. Ind. 1st & coll. 5s. gu.....	83½	Sale	83½	83½	77½	85
Cons. Ind. Coal Me. 1st 5s.....	76	78	76	Aug. '13	76	76
Cons. Coal 1st and ref. 5s.....		92½	93	Oct. '12		
Gr. Riv. Coal & C. 1st g 6s.....			102½	April '06		
K. & H. C. & C. 1st s f g 5s.....	91	98	98	Jan. '13	98	98
Pocah. Con. Coll. 1st s f 5s.....	85	85½	86	June '13	86	87½
St. L. Rky. Mt. & Pac. 1st 5s.....	77½	79	78½	Aug. '13	73	80½
Tenn. Coal gen. 5s.....	98½	99	99	99	98½	103
Birm. Div. 1st consol. 6s.....	101½	102	100½	Aug. '13	100½	103
Tenn. Div. 1st g 6s.....	100½	102	100½	July '13	100½	102
Cah. C. M. Co. 1st g 6s.....		103½	103	July '13	103	103
Utah Fuel 1st g 5s.....						
Victor Fuel 1st s f 5s.....		80	80	May '13	79½	80
Va. I. Coal & Coke 1st g 5s.....	92	92½	92	Aug. '13	92	98